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A CONSIDERATION OF THE PROBLEM OF THE FUNCTIONAL DYSPEPSIAS.[1]

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INTRODUCTION.

FUNCTIONAL nervous affections of the stomach are extremely diverse in their manifestations, and the art of the physician, his ability to improvise, and his ingenuity in treatment, find a large field in these forms of dyspepsia. My problem tonight is to place before you some ideas that may assist in the diagnosis and treatment of these disorders, and I hope you will bear with me if I have to treat very superficially and in a general way many parts that may need deeper discussion.

The majority of dyspepsias are not dependent on any gastric disease at all. Gastric manifestations are perhaps the commonest expression of disorders of the nervous system. To unravel them, we must inquire carefully into all the various attendant circumstances and take a most detailed history; the patient's environment, domestic, social, business or professional life may at once give the necessary clue that will unfold the cause of the dyspepsia, and some explanation may be found in domestic unhappiness, financial or other worries, or excessive responsibility. Again, some endocrine upset may be the ætiological factor concerned; the very common fatigue dyspepsia of the overwrought or disinterested and *blasé* middle-aged woman passing through the climacteric is a striking example of this. The real causal factors may lie in other quarters, and there may be varied disturbances in

[1] Read at a meeting of the Section of Medicine of the New South Wales Branch of the British Medical Association on June 15, 1933.

gastric secretory function under the influence of such factors as excitement, shock and emotional stress, while, combined with this, symptoms due to variations in the position of the stomach (mostly variations within the range of normality) may occur, and be intensified by nervous or neurogenic factors.

The term "functional dyspepsia" is used to cover all forms of dietary and habit indiscretions and constitutional causes which lead directly or indirectly to motor and secretory changes in the stomach, which may be normally or abnormally placed. Under the term we must also include all forms of gastric neuroses, whether associated with motor and secretory changes or not, all those diseases in which no "pathological-anatomical" change of the stomach is demonstrable and in which, therefore, the organ is diseased only in the "pathological-physiological" sense.

Occasionally an organic and functional condition may be combined in the one case, and our difficulty then is to know which of the two is primary, in order to apply our proper therapeutic measures. For example, peptic ulcer affecting a patient who is neuropathically inclined may present some symptoms of a neurosis. Fortunately, however, in the great majority of cases, patients with organic disease are usually free of functional troubles in the expression of their symptoms, and, on the other hand, chronic functional dyspepsia is not commonly followed by organic gastric lesions.

Non-organic diseases of the stomach far outnumber organic diseases; I suppose a very conservative figure would be the proportion of six or seven of the former to one of the latter.

Ætiology.

Ætiological factors concerned in the development of a functional dyspepsia may be either inherited or acquired. Among the inherited tendencies the habitus plays an important part. Individuals with the *habitus enteropticus* are most prone to this form of gastric disturbance. A consideration of the habitus may often assist a physician in his diagnosis. All conditions capable of weakening the constitution, particularly the nervous system, in fact all those leading to neurasthenia, hysteria, anæmia or malnutrition, will predispose. Tuberculosis, syphilis, insufficient nourishment, especially in persons physically or mentally overworked, may lead to anæmia and malnutrition, which may simultaneously cause neurasthenia with dyspeptic symptoms.

Alcoholic excesses, sexual abuses (especially masturbation), emotional strain and stress or worry from business, domestic or financial troubles, disappointment in love, or any factor that may weaken the nervous system, may play a part in the production of a functional dyspepsia.

Once the predisposition is present, common causes are malicious dietary habits, excessive or injudiciously chosen foods, mental excitement during meals, and dental factors.

In the first place, we usually eat too much, and we distribute our food so unevenly that overloading the stomach is most likely to ensue at one meal at least. The kind of food again is important; but here no dogmatic rules or generalizations are possible. What gives one person severe gastric symptoms may be perfectly digestible in others; evidently the relation of any gastric disturbance to the secretory or motor function of the stomach of a particular individual depends upon the type of secretion or motility.

Coffee and tea in excess, and the abuse of tobacco and alcohol, may play their part in the production of dyspeptic symptoms.

As important as the quality and quantity of food is the preparation. Improper preparation, especially of vegetables, may be injurious; fried foods are particularly noxious. Foods must be served simply, in a form easy for digestion. Excessively hot or excessively cold drinks are to be deprecated, as the ingestion of such, particularly in large amounts, may cause a very severe functional gastric disturbance. Hasty drinking may cause sudden tonus changes with consequent dyspepsia. Fluids should be drunk, not when the stomach is full, but between meals, before breakfast, and at bedtime; this will insure more rapid emptying of the stomach; an additional advantage is that less actual food will be eaten at the meal, for experience tells us that a person takes far less food when the meal is a comparatively dry one.

Most important as ætiological factors in chronic indigestion are dental troubles. Dental sepsis, especially *pyorrhœa alveolaris*, peridental infection, painful carious teeth, absence of teeth, badly fitting dentures or lack of these where required, inaccurate coaptation and malocclusion, are all conducive to inefficient mastication and impaired digestion of food. These defects must all be expertly corrected.

But even when all these points are attended to, improper eating habits must be avoided. The food must be masticated properly and efficiently and must not be bolted. If it is, even a mild, non-irritating meal may give rise to belching, heartburn and gastric discomfort, especially if there is any associated mental unrest. The mental attitude during a meal must be considered. Anger, business or other worries, concentrated upon during a meal, or any condition causing some mental disturbance, may easily provoke indigestion.

The relationship between exercise and digestion also needs attention. Too little exercise results in flabby musculature and gastric atony, while too much just after a meal tends to cause pylorospasm, delayed motility and gastric hypertonicity, and so induces functional disturbances and distress. Moderate physical exercise, taken not too soon after a meal, helps tonicity and aids digestion.

Other general factors that need consideration are the age and the habits of the individual. All ages are susceptible, but the most frequent sufferer is the adult in the third or fourth decade. At this age the individual has more responsibilities and worries,

usually does not take proper or sufficient exercise, and may keep irregular hours. In women the menopause is prone to give rise to gastric neuroses; at this time spastic constipation and hyperacidity are often associated. The atonic constipation of advancing years may cause a reflex anorexia, though often the lessened nervous tension associated with old age and the natural diminution of gastric acidity, may spontaneously tend to correct a previous gastric hyperirritability.

With regard to the habits of the individual, those that concern us most are the use of tobacco and alcohol, both of which may be very deleterious. Excessive cigarette or cigar smoking is, I think, the most harmful form of immoderate use of tobacco. It promotes an abnormally high and abundant gastric acidity and often pylorospasm. The abuse of alcohol over a long period causes diminished gastric secretion in most cases, and, of course, over very long periods, may cause a definite chronic gastritis.

Finally, one other factor has to be emphasized, and that is trauma, which may occasionally cause functional stomach disturbance in the nature of a traumatic neurosis.

Classification.

The classification of non-organic diseases of the stomach is an arbitrary one. In evaluating the symptoms and ætiological factors, we see at once that many are hardly sufficiently clear-cut to be independent and well defined diseases. The same set of conditions (for example, faulty teeth and foods) and psychical factors may cause wide variations in secretory and motor functional disturbances. Consequently, it is impossible to make hard and fast classifications. Even though we place the pure gastric neuroses among the psychoneuroses, we still find some conditions grouped in one class that cannot be totally excluded from another; such, for example, are pylorospasm and cardiospasm, both of which may be neurogenic in origin, or may occur as part of the picture of some functional motor disturbance that may again be associated with an organic lesion, even extra-gastric. Many types of functional gastric disorder merge gradually into one another and have symptoms in common; if we succeed in making an intelligent classification that will help in putting before our minds each condition as a fairly clear picture to aid us in our diagnosis and therapeusis, we must rest satisfied. For all practical purposes we may divide non-organic diseases of the stomach into three main groups: (i) true functional cases, those in which secretory or motor disturbances predominate; (ii) functional disturbances in the stomach which are merely reflex manifestations, other than gastric in origin; (iii) the gastric neuroses.

True Functional Dyspepsia.

The true functional cases include all dynamic disorders or aberrations in quantity or quality of secretion, such as hyperchlorhydria, hypersecretion, gastro-succorrhœa (Reichmann's disease), hypochlorhydria, achlorhydria, achylia *et cetera*. They also include disorders of motor function of the stomach, such as motor insufficiency, gastric atony (primary or secondary), gastric dilatation, cardiospasm (achalasia of the cardia), pylorospasm, and peristaltic unrest (*tormina ventriculi*).

Reflex Disorders.

The functional dyspepsias of the stomach that are reflex manifestations of disturbances in the intestines or other organs may be associated with chronic appendicitis, spastic constipation, cholecystitis, cholelithiasis, pancreatic disease, intestinal disorders, pulmonary disease (especially phthisis), and, finally, some cardiac, toxic and blood diseases.

Perhaps the commonest of these causes is spastic constipation, which may cause most severe indigestion. The relief of the constipation immediately leads to a disappearance of the gastric symptoms.

Next in order of frequency in cases of this type are the appendicular dyspepsias. The following are cases in point.

Case I.—The patient, a clerk, aged forty-five years, complained of belching and flatulence, epigastric discomfort and fullness after meals, with mild pain, which came on usually two or three hours after food and was relieved by food or bicarbonate of soda. His bowels were very constipated. The indigestion was always more or less present, but periodically would get very severe, these exacerbations lasting for a day to a week. He was a heavy cigarette smoker, but took very little alcohol. He had not lost weight. Eight years previously his left breast had been removed, for what the surgeon, Sir John McKelvey, had told him was an innocent tumour. He was insured after this, his life being rated "first class". His teeth were all in good order. He was of a normal habitus. There was no evidence of organic disease in any of his systems. Gastric analysis revealed a marked hyperacidity, with a tendency to hypersecretion. X ray examination of his gastro-intestinal tract showed a hypertonic stomach, which was completely empty two hours after a meal; there was hyperperistalsis. There was no evidence of any organic lesion nor of any duodenal or gastric ulceration.

X ray examination and fluoroscopy after a barium enema revealed pronounced spasticity of the colon.

Occult blood was not found in the fæces. The sigmoid colon was spastic.

Exercise, a diet suitable for the management of constipation, with the use of senna, bromides and belladonna, the omission of tobacco, and the occasional use of an alkaline powder for temporary relief, effected a complete cure.

Later, the patient smoked in moderation without ill effect or any return of his hyperchlorhydric symptoms, although he noticed his tendency to constipation would increase the more he smoked.

An additional point of interest in this case is that the symptoms might possibly be suggestive of a duodenal ulcer.

Case II.—The patient, a grazier, aged twenty-five years, complained of flatulence, belching, general discomfort and pain after meals. The pain, which usually appeared soon after eating, and was rather more of the nature of a continuous distress, was partly, but not wholly, relieved by food and bicarbonate of soda.

Inquiry elicited the fact that he had had at least two attacks of pain in the previous three years, in the right iliac fossa, lasting a few days, and accompanied by nausea. His appetite varied and was not good on the whole, and he had very little desire for food. His bowels were constipated. Except for an attack of pleurisy eight years previously, his health generally had been good up to five years previously, when his trouble had commenced.

Physical examination revealed nothing abnormal save that there was a slight tendency to nausea when pressure was applied over the appendix.

X ray examination revealed no abnormality in the gastro-intestinal tract, nor any evidence to suggest a pathological appendix, which was not filled or seen.

The results of gastric analysis were normal. No occult blood was found in the fæces. I advised him to have his appendix out; but he did not do so until two years later, when he had a mild acute attack. Since the removal of his appendix about eighteen months ago he has been perfectly well, can eat anything, and leads a normal life.

These cases of functional dyspepsia associated with a pathological condition of the appendix, the so-called appendicular dyspepsias, are well recognised clinical pictures, though possibly the decision to remove an appendix for the relief of dyspepsia is often made too hurriedly and with insufficient evidence. Under such conditions many patients are doomed to disappointment; but, on the other hand, there is nothing more satisfactory, dramatic even, than the prompt relief of dyspeptic symptoms following appendicectomy, when a pathological appendix has been the reflex cause.

Organic diseases, such as intestinal tumours, carcinoma of the colon, particularly if there is partial obstruction, tuberculosis of the intestines and herniæ, may cause reflex gastric disturbances. In addition, gall-stones, chronic cholecystitis, pancreatititis and pancreatic tumours, renal calculi and renal disease, chronic ulcerative colitis, diverticulitis *et cetera*, may all give rise to deranged digestion. Diseases of the nervous system, especially some forms of syphilis, *tabes dorsalis*, and brain tumours, often cause gastric motor disturbances.

Some pulmonary diseases, such as asthma, chronic bronchitis with emphysema, and, particularly, phthisis, and certain cardiac troubles, such as coronary thrombosis, failure of compensation and some forms of arrhythmia and tachycardia, may be associated with reflex gastric troubles.

Finally, we have the disturbances in gastric function due to anæmia and metabolic or toxic diseases, such as *diabetes mellitus* and chronic nephritis.

The Gastric Neuroses.

The gastric neuroses are diseases of the mind or of the nervous system, in which the attention of the patient is focussed on the digestive apparatus. In the concept of the neuroses, I think the easiest plan is to follow the Freudian school and subdivide the main group into two sub-groups: (i) The transference neuroses or psychoneuroses, in which the disease process and the symptoms are made up of a varied set of psychological symptoms, and the gastric manifestation is merely part of the general disturbance; these may be used for purposes of erotic stimulation, or as substitutes for primitive erotic gratification, which may be encompassed by a very extensive psychological superstructure, or they may be part of the expression of an anxiety or conversion hysteria. (ii) The physioneuroses, the actual or somatic neuroses, in which the local reference of the disease is more obvious; here the psychological superstructure is limited, and the expression is in the form of somatic symptoms, in this case gastric. In this group are included hypochondriasis, neurasthenia, the anxiety neuroses, a group resulting from autonomic nervous disturbances, and, lastly, the traumatic neuroses.

Certain disturbances in the perfect coordination of the autonomic nervous system, constituting autonomic imbalance, may result from an anxiety or traumatic neurosis, or may be seen in neurasthenia or hypochondriasis, and in most of these cases the predominant features are those of vagus hyperirritability. Case III is a good example of nervous hyperacidity occurring in neurasthenia.

Case III.—A male, aged thirty-two years, an accountant, was neurasthenic and introspective. His symptoms, which had existed for four months, consisted in pressure and epigastric discomfort after food, burning pain, occasional vomiting, eructations of wind, and pyrosis. He stated that his trouble had come on after he had lost his wife and son. His nerves and general health, however, had not been good for some time; he had had a great deal of worry due to illness in the home. His appetite was variable; he slept badly, was inclined to become very irritable, and was easily depressed. The bowels were sluggish. He abstained from alcohol and tobacco. He was liable also to general symptoms, such as attacks of palpitation, with some precordial discomfort and tightness, faintness and clammy sweats, generally relieved by belching. He had lost 9·9 kilograms (twenty-two pounds) in weight during the previous year.

No abnormality was detected in his gastro-intestinal tract by X ray examination. There was no occult blood in the fæces. Gastric analyses showed a marked hyperacidity. No evidence of any organic trouble could be found in any of his systems. He had the *habitus enteropticus*.

He was first given bromides, bicarbonate of soda, and belladonna, without much improvement. As he showed signs of mental instability, he was put into hospital and treated with bromides and "Luminal", the free administration of alkalis, and daily gastric lavage for about a week. His improvement was very slow, and after a month he went away for a holiday. He is now fairly well, though he gets mild attacks of a transient nature at rare intervals.

As an example of autonomic imbalance resulting from an anxiety neurosis Case IV is of interest.

Case IV.—A man, aged forty-five years, engaged in business, who had tremendous responsibilities and was over-conscientious, had been under a great strain for some years. He was of a neurasthenic and hypochondriacal type. He complained of epigastric fullness and coincidentally marked palpitation and tachycardia after food. Very often with his attacks he would get intense dizziness, a burning sensation in his epigastrium, nausea and pyrosis. A feeling of depression and annoying pains across his chest and back were very prone to occur. He had lost no weight. He smoked excessively, mainly a pipe. He was a moderate drinker. Abstinence from tobacco did not cause any appreciable change in his attacks, though he was better on the whole if he smoked in moderation, while he really had less discomfort if he took some alcohol, particularly before meals.

Examination revealed no organic trouble. He was convinced in his own mind that he had some cardiac trouble, and, although no abnormality was revealed by electrocardiography (done to restore his confidence), it was hard to convince him that his heart was perfectly sound.

This class of case represents a very difficult problem in therapy. It often affects business men under severe mental strain or any cause of stress or worry that may produce an anxiety neurosis of the type of autonomic imbalance. The same condition is seen

in greater or less degree very often among women at the menopause. Autonomic imbalance from some mental strain or stress may result as part of disturbed endocrine changes and be associated with a true somatic neurosis referable to disturbances in the functions of the stomach. These cases are often accompanied by a mucous colitis. Great care is necessary to eliminate the possibility of gastric or intestinal new growth.

Gastric symptoms that were fixations on a traumatic experience were often seen in the Great War. In this group of traumatic neuroses some autonomic disturbance is taking place in conjunction with a definite group of symptoms that are repetition phenomena; these are true somatic neuroses. Case V is an example.

CASE V.—A married woman, aged thirty-two years, complained of vomiting after meals for the previous eight months, with epigastric fullness and discomfort, and gnawing pain in the epigastrium, which varied a good deal and had no relation to food or meals. She stated that her symptoms had come on immediately after a motor accident in which her sixth, seventh, and eighth ribs on the left side had been broken. She could not ride in a car without severe exacerbation of her symptoms, and at first, even if she merely had the intention of going anywhere by car, she would get worse. She kept fairly well if she was very quiet and did not go about very much. She had lost over 12·6 kilograms (two stone) in weight since the accident, but still weighed over 69·3 kilograms (eleven stone). Her appendix had been removed fifteen years previously.

She had obesity rather of the Fröhlich type. X ray examination of the gastro-intestinal tract, and examination of the fæces for occult blood revealed no abnormality. Gastric analysis revealed a marked subacidity. No evidence of any organic lesion was found.

This patient did well on a modified Weir Mitchell treatment, taking bromides, valerian and "Luminal".

SYMPTOMATOLOGY.

The symptoms and signs of functional stomach trouble are variable and not very characteristic. They may be acute after severe dietary indiscretions, when they may take the form of nausea or vomiting, belching, epigastric discomfort and fullness or even cramp-like pains, associated with cold perspiration, salivation, depression, headache and general lassitude.

In chronic functional dyspepsia all types of general gastric symptoms are encountered, the chief being pain or distress, nausea, vomiting, flatulence, heartburn, epigastric fullness, disturbances of appetite, and, finally, constitutional and nervous symptoms.

Pain and Distress.

As a rule pain is not a symptom of nervous affections of the stomach, and when it does occur, particularly if it has some definite regularity, we should always think of an organic lesion of the mucous membrane of the stomach. Certain unpleasant sensations in the epigastrium may be described in neurasthenia and nervous dyspepsia, but actual pain or cramp rarely occurs, and, as a general rule, the absence of real pain differentiates functional from organic disease.

Pain resembling hunger pains, occurring two or three hours after food and relieved by food and alkalis, may be caused by functional hyperchlorhydria, alimentary hypersecretion and gastrosuccorrhœa, also, reflexly, by some distant focus of abdominal infection or disease. Such pains may be cramp-like and localized to the epigastrium, and radiate to the lower part of the chest; but they are more variable from day to day than the pains of organic disease, and are not usually so prolonged.

Pain due to the neuroses is multiform, varying from a sensation of burning, aching or tingling, to what the patient calls gnawing pain, combined with a feeling of dull pressure in the epigastrium, or fullness and distension. The so-called pains of the neuroses are usually independent of food, are present at all hours of the day, are unrelieved by food, alkalis or vomiting, rarely occur at night, and usually lack the radiation typical of organic disease. The regular periodicity of the pain of organic disease, particularly gastro-duodenal ulcer, is usually missing.

Nausea and Vomiting.

Nausea is a very common accompaniment of chronic dyspepsia of all kinds, while vomiting is more frequently met with in the reflex dyspepsias and the neuroses. It may be a purely hysterical phenomenon, or a conversion symptom for a psychic or sexual repression, in any of the somatic neuroses; that is to say, an hysterical conversion of repressed sexuality; or it may constitute a symptom of autonomic imbalance. The symptom is mostly seen in women, usually young and unmarried, and the attacks are often excited by some psychic stimulus, such as fear, excitement or mental strain.

CASE VI.—A single girl, aged twenty years, complained of being obliged regularly to leave the table hurriedly and vomit her evening meal. She had been troubled in this way for four months. She had had amenorrhœa for the previous three months, but had had periods of amenorrhœa before. She thought she might be pregnant, but did not think she was. She admitted coitus on one occasion only (just prior to the commencement of her vomiting attacks), which took place in her own home. She did not vomit after any meal but dinner, and had no other gastric symptoms. Her bowels were constipated, and she had the *habitus enteropticus*. She had not lost any weight. Physical and radiological examination revealed no evidence of organic disease. There was only a slight gastric subacidity. She was not pregnant, and her pelvic organs were normal.

I do not know how she progressed.

This was either an example of a pure autonomic nervous disorder, or, more probably, there existed some repressed sexual association with the evening meal, that is to say, it was a transference neurosis of the nature of an anxiety hysteria or the result of a difference in purpose between a desire of an erotic nature and her own sense of self-respect and duty.

Neurotic patients tolerate vomiting well; they vomit easily, and the act, as a rule, seems to cause very little physical discomfort. They often remain well nourished, in contrast with those patients whose vomiting is caused by pylorospasm induced by organic disease, or physical pyloric stenosis.

Sometimes the differentiation of nervous vomiting from gastro-duodenal ulcer with pylorospasm is difficult, particularly from ulcer associated with neurasthenia, hypochondriasis or neurosis. For years these latter cases may be labelled psychoneurosis or hysteria. I am afraid that when organic disease does occur in a neurotic person the tendency is to stress the neurosis and forget the possibility of a pathological entity.

Other motor manifestations of the gastric neuroses include rumination, of which I have had no experience, peristaltic unrest (*tormina ventriculi*), cardiospasm and pylorospasm; but time will not permit more than a mere mention of these.

Belching and Flatulence.

Belching and flatulence may occur in all types of neuroses and functional disorders of the stomach. The belching may be very loud and noisy, and often have a bad odour. Nervous belching consists in a succession of loud eructations, occurring independently of meals, and having no relation to the type or quality of the food. This is a true neurotic phenomenon. Closely associated with nervous belching is aerophagy, which is a frequent symptom of hysterical young women.

Heartburn.

Heartburn may occur in functional dynamic disorders of the stomach associated with hyperchlorhydria; but even patients with achlorhydria may sometimes complain of it.

This symptom is often seen as part of a neurosis, not based on any hyperacidity or hypersecretion. It is often an evidence of fear, anxiety or fatigue, may occur independently of food and even in the fasting state. It is usually relieved by rest and quiet; alkalis have little, if any, effect. Nervous heartburn may, and often does, occur in a condition of anacidity, and is frequently complained of by patients suffering from *achylia gastrica*, with its accompanying nervous disturbances.

Pressure and Fullness.

A sensation of substernal pressure and epigastric fullness occurs almost solely after food, either immediately or within ten to thirty minutes. Sense of pressure and fullness in the gastric region, with a hot burning feeling, sometimes culminating in a gnawing pain, even occasionally a cramp-like pain, is characteristic of conditions associated with hyperchlorhydria.

Disturbances of Appetite and Hunger.

Most functional dyspeptics with hyperchlorhydria have a keen appetite and rapid digestion; the appetite is usually poor in the nervous dyspepsias and in functional conditions associated with diminution of gastric secretion.

Psychoneurotic persons are very liable to disturbances of appetite and hunger. There may be complete loss of appetite, as seen in *anorexia nervosa*, which may be an anxiety hysteria or an anxiety neurosis. An example of such is the following.

CASE VII.—The patient, a female, aged twenty-eight years, complained of complete loss of appetite and aversion to food. The trouble had come on suddenly three months previously, after a shock and a good deal of emotional disturbance. She had been engaged to be married and the engagement had been broken off.

She was anæmic, nervous and poorly nourished, and had the *habitus enteropticus*. Her teeth were good. Her throat was healthy. Her bowels were constipated. The menses were regular, though the flow had been scantier and paler recently. No evidence of organic disease was found by physical or radiological examination. Gastric analysis revealed subacidity.

This patient was given a modified Weir Mitchell treatment, with complete rest and general massage, and the administration of dilute hydrochloric acid, and glycerin of pepsin, and "Luminal". These were replaced after four weeks by a mixture of iron and arsenic. She went for a sea trip and became perfectly well.

Abnormal and voracious appetites—bulimia and polyphagia—sometimes occur. The following history of a patient affected with bulimia is a very instructive one.

CASE VIII.—The patient was a boy, aged fifteen years. He had a voracious appetite, and used to take excessive amounts of food. From the age of five he had had an abnormal appetite, which had caused obesity. He used to suck his thumb as a baby and a small boy before he developed his excessive appetite. He was at first thought to be suffering from pituitary deficiency; but his obesity was due to his excessive food intake. When this was being treated and food was kept from him, he developed the impulse to steal food, and later, when he began to feel conscious of his obesity from the curiosity it aroused among his mates, he had to repress his desire for food, and then developed certain hysterical substitutes in recurrent tics involving the eyes and mouth and swallowing without food.

The notes of this case came from Dr. B. B. Crohn at Mount Sinai Hospital while I was in New York. I do not know if he ever overcame his abnormal conversion and transference phenomena. This was evidently a case in which the child obtained great pleasure from his food, and he gratified an abnormal oral eroticism.

Other rare types of disturbance to the appetite are: (i) sitisphobia, or morbid fear of eating; (ii) parorexia, or a perversion of appetite, with a craving for unusual foods or for inedible substances; (iii) akoria, or an absence of the sensation of satiety after eating. These are symptoms of neurasthenia and the psychoneuroses, though they may be caused by some brain tumours, cerebrospinal syphilis at times, and some insanities. The eating of disgusting and offensive substances is known as allotriophagia; it is practically confined to degenerates and insane persons. I have had no personal experience of such.

Constitutional and Nervous Symptoms.

Constitutional and nervous symptoms may take the form of dizziness, cardiac palpitation, headache, insomnia, lassitude, physical tiredness and mental fatigue, with inability to concentrate, all of which may be due to functional and nervous disorders of the stomach. Headache particularly is apt to be a symptom of functional dyspepsia; in my experience it is never caused by any uncomplicated organic gastric disorder. Many patients suffer from

insomnia, which occasionally is one of the main troubles and may be very intractable.

Skin troubles, such as generalized pruritus, a form of chronic urticaria, angioneurotic œdema, are not infrequently seen, particularly in highly neurotic individuals. Such cases may be due to food allergy. Case IX is a good example.

CASE IX.—The patient, a female, aged twenty-four years, a typist, who was also subject to attacks of urticaria, complained of severe indigestion whenever she ate certain foods. She thought she used to get very severe bouts if she ate lobster, tomatoes or cheese. These attacks of indigestion were practically always followed by bronchial asthma, sometimes mild, at other times so severe that an injection was necessary. The urticaria was never accompanied by asthma. She had *habitus enteropticus*.

The skin reacted markedly to tests with extracts of the above-named foods. No organic lesion was discovered by X ray examination of the gastro-intestinal tract. Gastric analysis, when she consulted me and when she was free from symptoms, revealed a normal iso-secretory curve. In hospital just after one of her attacks there was high acidity with some hypersecretion.

This was probably a pure vagus neurosis. Evidently the increased acidity with some delayed motility, caused by sensitivity to foods that she had difficulty in digesting, was the important factor in the production of her symptoms.

The bowels are usually constipated in functional dyspepsias, except when there is achylia or anacidity, when the bowels are often loose. Diarrhœa may be an important feature of *achylia gastrica*. The type is that of the diarrhœa of ingestion, and frequently follows shortly after a meal. Not uncommonly it appears to have no relationship to the act of eating, and at times it is rather intractable. The stools may be offensive, and in bulk out of all proportion to the amount of food taken. Soreness and tenderness of the tongue may be associated.

Lastly, anæmia, muscular debility, asthenia, bad and sallow complexions, clamminess and coldness of the hands and feet, and other vasomotor disturbances, and many signs of auto-intoxication, are seen in chronic functional dyspepsias, particularly those with gastroptosis and gastric atony, and characterized by a diminished gastric secretion.

Constitutional disturbances are usually slight at first; later some loss of weight may be noted.

PHYSICAL EXAMINATION.

In the vast majority of cases examination of the abdomen reveals little abnormal. Most of the patients have the *habitus enteropticus*, and in some cases, particularly if there is great atony, the greater curvature of the stomach may reach far below the umbilicus, even to the pelvis. Patients with gastric atony often have anæmia with marked subacidity or anacidity. Case X is an example of this type.

CASE X.—The patient was a single girl, aged twenty years, complaining of belching, sour eructations after food, flatulence and fullness after meals, even very light meals at times. More or less nausea was always present, and there were occasional vomiting attacks. The appetite was poor and easily satisfied. She suffered from headaches, which had no relation to food, and were always severe at the beginning of her menses, which were regular, though somewhat scanty. She wore glasses, which had been recently checked by an oculist. The bowels were constipated. She did not smoke or take alcohol. She had been ill for some years, and had lost over 18·9 kilograms (three stone) in the past two years. She was poorly nourished and neurasthenic, and had *habitus enteropticus*. Her teeth were good. Her tonsils had been removed.

The red blood cells numbered 3,800,000 per cubic millimetre; the hæmoglobin value was 70%. Radiographic examination revealed an extreme degree of gastroptosis. The stomach was large and hypotonic and contained some secretion. The peristalsis was weak. There was a small residue present six hours after the fluid meal. No organic lesion of the stomach or duodenum was found.

Gastric analysis revealed a very low acidity at first, with a slight tendency to some hyperacidity towards the end of the test (two and a half hours). No occult blood was found in the fæces.

She was given a nutritious diet of high calorific value, of small food residue. She was treated with massage, iron arsenite injections, "Luminal" and "Tricalcine", and a modified Weir Mitchell *régime* for four weeks.

Later, she wore an abdominal belt of the Curtis type, and continued with iron by mouth, along with some "Phyllosan" and later "Ostelin". She improved considerably and put on 6·75 kilograms (fifteen pounds) in weight in three months.

Dyspepsias of dietary origin usually affect well preserved persons who over-eat, have sedentary habits, and take too little exercise. These are the sthenic dyspepsias. The nervous dyspepsias as a rule affect thin, highly strung, emotional creatures, usually poorly nourished, often anxious from worry and lack of sleep, and exceedingly introspective. This is the group of asthenic dyspeptics, with their sallow, thin faces, longitudinal or concave chests, narrow epigastric angles, often floating tenth ribs, exaggerated peripheral reflexes, general abdominal tenderness and hypersensitiveness to pain. The physical characteristics of the sthenic class of dyspepsias are in direct contrast to these. They are vagotonic in type, with a wide epigastric angle, slow pulse, spastic sigmoid, and a tendency to hyperacidity and constipation.

The reflex dyspeptic generally has the appearance of one who really suffers. He generally shows evidence of some loss of weight, and he makes no attempt to stress his symptoms, but tells them plainly and without exaggeration, and he is not introspective. We must examine the condition of the gums and teeth. The gums are often pale and spongy; the teeth may be deficient or carious, or pyorrhœa may be present.

Examination of the tonsils is important, and the physical examination must cover the accessory sinuses. Offensive breath, especially if tonsils are septic, or if any carious or septic teeth are present, may be encountered. Attacks of aphthous stomatitis and herpes of the upper lip or anterior portion of the hard palate are at times recorded.

Finally, the physical examination must include a complete investigation of every system, as, apart from the fact that organic disease of the stomach must first of all be excluded, it is essential that any extra-gastric organic disease of which the dyspepsia may be a reflex phenomenon, must be recognized.

GASTRIC ANALYSIS.

Some useful information may be obtained from charts of gastric analysis; but those who expect to

find in these curves new and infallible criteria for the diagnosis of functional dyspepsia will be disappointed. At the same time the information disclosed is often of value in indicating some particular functional secretory disturbance. This is of great clinical importance, not only in classification, but also in the choice of suitable therapy. The use of fractional test meals works out very successfully in actual practice, in spite of all the well known objections, that the method only records one particular cycle of digestion taken under special conditions, and that the amount of acid secreted very often varies greatly in the same individual at different times and under different conditions. These objections can be met; the actual type does not vary greatly, even though there may be variations in degree. The important fact for us clinically is that we get knowledge regarding the physiology of the entire cycle of digestion from the beginning fasting state to the very end of the digestive period.

Any type of curve may be obtained in functional dyspepsias and gastric neuroses, though many curves are suggestive of a neurosis by the atypical nature and departure from the normal, as judged by Rehfuss's standards. Occasionally some bizarre and fantastic curves are met with (Charts II and III).

Very many are normal; others demonstrate a hyperchlorhydria in which the acidity rises rapidly and higher than the normal, though the emptying takes place in the usual time (Chart I).

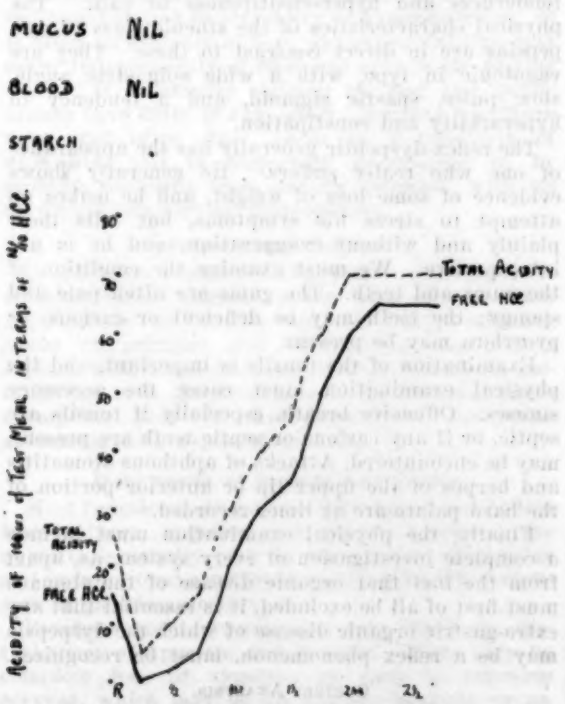

FIGURE I.

Graph showing results of analysis of gastric contents in a case of simple functional hyperacidity.

Variations may take place; for example, the acidity may rise and fall very quickly (Chart II), or there may be late hyperacidity (Chart III).

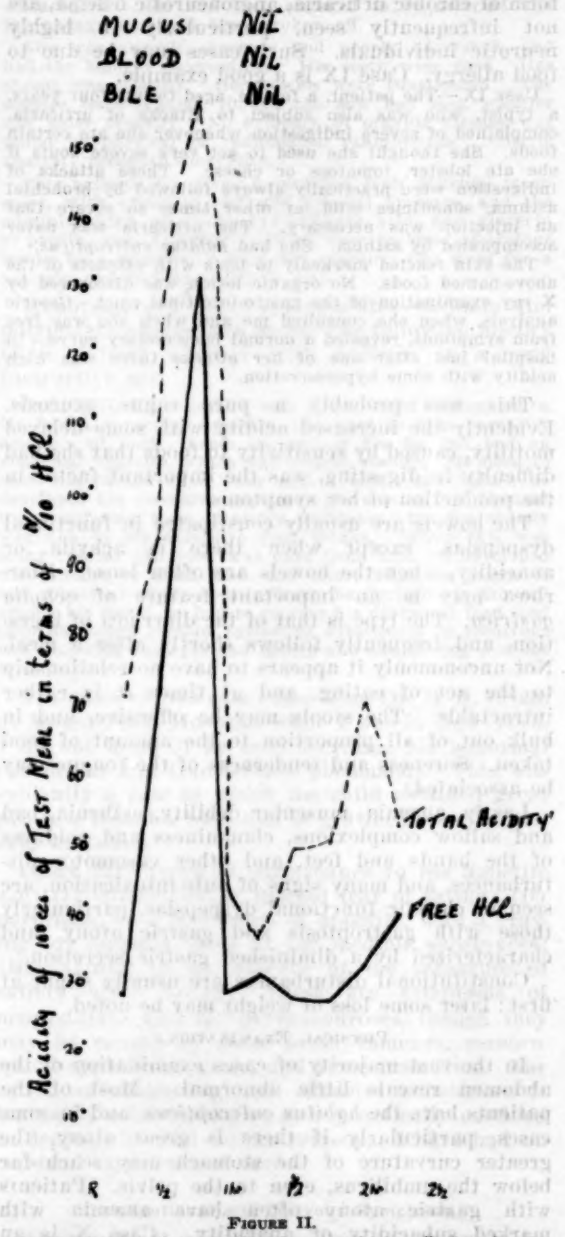

FIGURE II.

Graph showing hyperacidity in a patient suffering from psychoneurosis with gastric symptoms. (After Crohn and Reiss.)

For the demonstration of digestive or alimentary hypersecretion the fractional test meal method is unequalled. This type of case is a most interesting one to study; for the secretion of gastric juice may continue for hours after the normal period of digestion. A consideration of Charts IV and V will

show this well. Chart IV, illustrating the type of continued hypersecretion met with in cases of gastro-succorrhœa or supersecretion, shows the primary completed digestive stage ending in two and a quarter hours and followed by a continuous

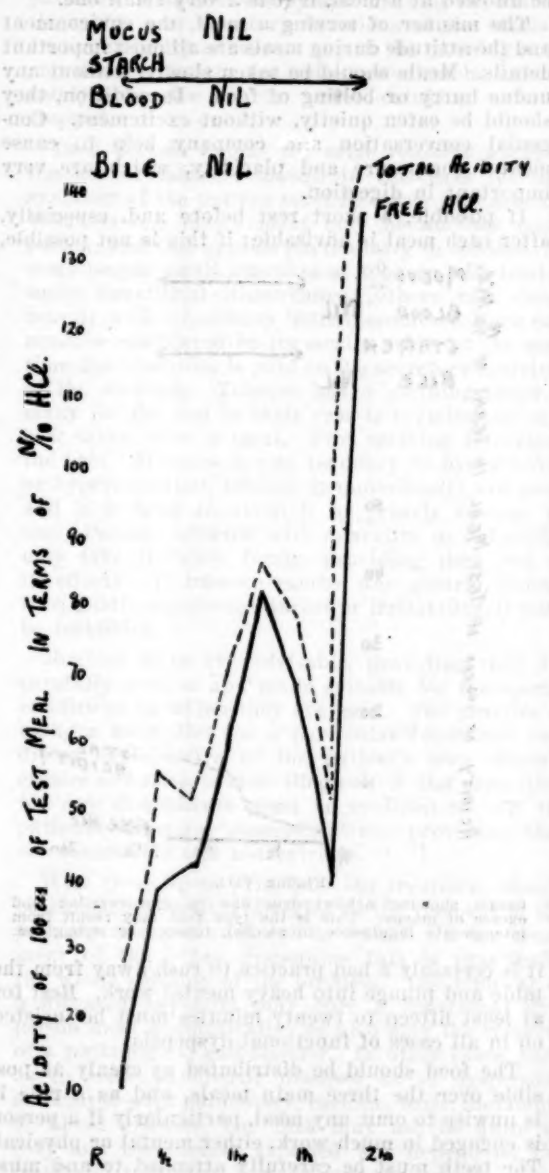

FIGURE III.
Graph showing late hyperacidity in a patient suffering from neurosis. (After Crohn and Reiss.)

cycle of hypersecretion. Chart V illustrates alimentary hypersecretion. It is to be noted here that the hypersecretory activity follows directly after, and as a continuous part of, the digestive phase.

Anacidity and subacidity, both of which may occur in functional dyspepsias, are not perhaps so commonly met with as hyperchlorhydria. The commonest association in my experience is open dental sepsis or pyorrhœa (Charts VI and VII).

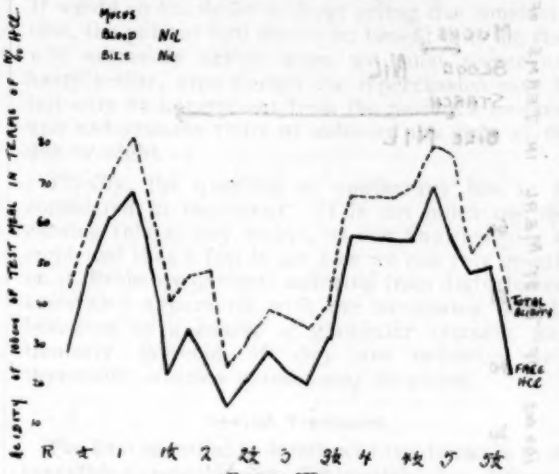

FIGURE IV.
Graph showing continued hypersecretion in gastro-succorrhœa. (After Crohn and Reiss.)

Achlorhydria may also be seen in some people who indulge excessively in tobacco or strong tea, and who suffer from functional gastric troubles (Chart VIII).

TREATMENT.

Prophylactic Treatment.

Bad habits of eating and indiscretions in diet cause by far the greatest number of dyspepsias.

Meals should be taken regularly, and no food should be taken between meals. Sufficient time must be allowed for food to pass through the

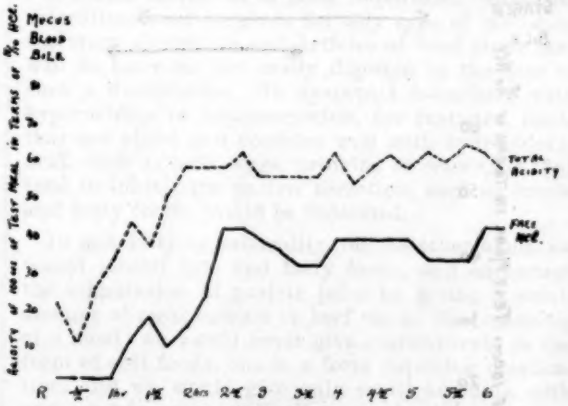

FIGURE V.
Graph showing hypersecretion. (After Crohn and Reiss.)

stomach before the next meal. As a rule, unless there is some indication to the contrary, it is to be recommended to avoid fluids at meals, certainly excess of fluids, as, first, they distend the stomach and act as a stimulant to the production of gastric

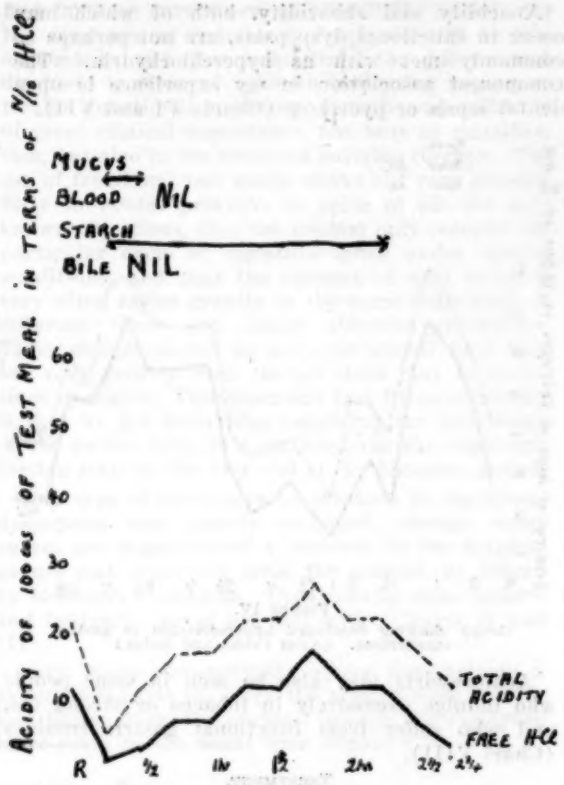

FIGURE VI.

Graph showing subacidity. The patient suffered from functional dyspepsia associated with dental sepsis.

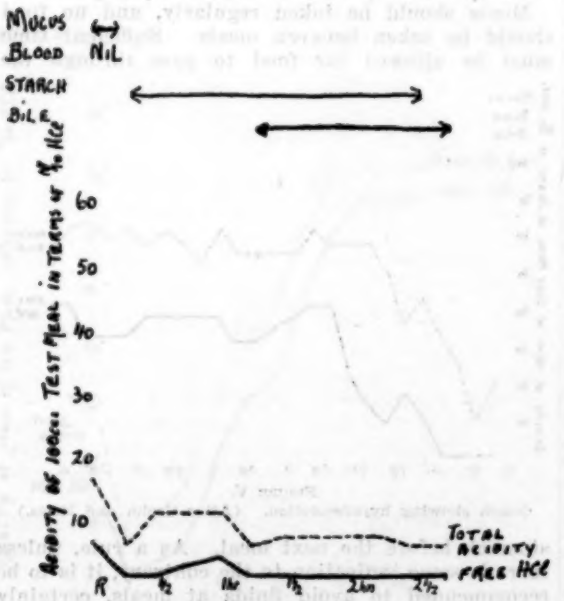

FIGURE VII.

Graph showing almost complete achlorhydria. The patient suffered from functional dyspepsia and dental sepsis.

juice, and, secondly, what is more important to my mind, the less fluid that is taken the less food is eaten. Fluids, particularly water, are best taken between or perhaps before meals, in the early morning, and at bedtime. Fluids in moderation may be allowed at a meal, if it is a very small one.

The manner of serving a meal, the environment and the attitude during meals are all most important details. Meals should be taken slowly, without any undue hurry or bolting of food. In addition, they should be eaten quietly, without excitement. Congenial conversation and company help to cause mental composure and placidity, which are very important in digestion.

If possible, a short rest before and, especially, after each meal is advisable; if this is not possible,

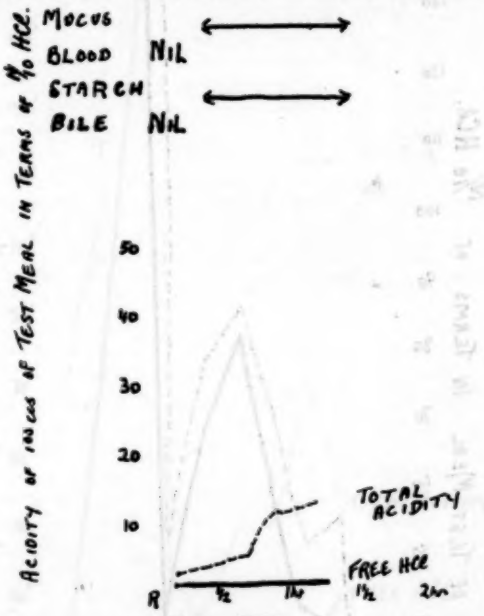

FIGURE VIII.

Graph showing achlorhydria due to hyposecretion and excess of mucus. This is the type that may result from intemperate indulgence in alcohol, tobacco or strong tea.

it is certainly a bad practice to rush away from the table and plunge into heavy mental work. Rest for at least fifteen to twenty minutes must be insisted on in all cases of functional dyspepsia.

The food should be distributed as evenly as possible over the three main meals, and as a rule it is unwise to omit any meal, particularly if a person is engaged in much work, either mental or physical. The teeth must be carefully attended to and must be such as to insure good mastication; care must be taken to see that artificial dentures are comfortable and efficient.

General Treatment.

The teeth and all possible foci of infection, particularly in the region of the mouth, nose and throat, should be suitably dealt with. These precautions are absolutely necessary and must be

carried out without delay at the beginning of treatment.

Coffee and tea must be restricted in most cases, particularly coffee; though a fair compromise may be usually effected by making due allowance for the patient's condition and symptoms, and the state of the motor and secretory functions of the stomach. In the majority of cases a cup in the morning and a cup during the day are quite peremissible, but certainly excessive tea or coffee drinking must be stopped.

To a certain extent the same remarks apply to the use of tobacco, though in this case the idiosyncrasy of the patient must be taken into account. What is one man's meat may be another man's poison, and this applies particularly to tobacco. In some people small amounts of tobacco will tend to cause functional disturbance; others can smoke heavily with apparently little discomfort. Each case must be considered on its merits, while at the same time due attention is paid to the secretory activities of the stomach. Tobacco has a soothing effect to many people, and in their case is permissible; it is best taken after a meal. Pipe smoking is perhaps the best. If there is any tendency to hyperacidity or hypersecretion, tobacco is undoubtedly not good, and it is wise to avoid it or greatly restrict its use. Persons affected with anacidity or subacidity may take it fairly freely, providing they feel no ill effects. If tobacco excites any gastric discomfort, giddiness, mental unrest or irritability, it must be forbidden.

Routine diets are advisable, providing they are carefully studied and made suitable for the special conditions in which they are used. The practice of using a fixed diet for a particular functional condition, irrespective of the patient's own idiosyncrasies or habits, is most illogical. A diet prescribed for any disturbance must be modified to suit the patient's personal susceptibilities, providing they are reasonable and not extreme.

With these broad principles our treatment should be almost exclusively directed to the removal of the primary cause, if such can be found. In the treatment of the reflex dyspepsias this is practically the whole solution of the problem. The removal of a diseased appendix may cure a functional dyspepsia most dramatically; so also may the removal of a pathological gall-bladder. In other cases, such as in some pancreatic diseases or in dyspepsias associated with pulmonary, cardiac, toxic, metabolic or blood diseases, our task may not be quite so easy and the success attained will depend on the results of treatment for the primary trouble.

The treatment of the true psychoneuroses and actual somatic neuroses presents a much more difficult problem. In the psychoneuroses, in addition to the purely gastric manifestations, one has to contend with the maladaptations of the conscious problems of the individual. For these transference neuroses the treatment must be along psychiatric lines, and if the case presents any difficulty it should be handed over to a psychiatrist before the disturbance becomes too firmly established.

In the physioneuroses we have to be particularly careful not to advise operation on the stomach or other organ, unless there are clear indications for it. If we do so hurriedly without giving due consideration, the patient will derive no benefit and the time will assuredly arrive when we must regret our hasty action, even though the repercussion may be felt only by harassment from the patient's frequent and unfortunate visits or calls at any time of the day or night.

Finally, the question of opotherapy has to be considered in treatment. It is not much use discussing this at any length, as our knowledge is so empirical that I fail to see how we can rely greatly on it. Probably patients suffering from disturbances associated apparently with the menopause may be benefited by a course of glandular extracts, particularly thyreoid, if they are definitely subthyreoidic; ovarian extract may be added.

Special Treatment.

The first essential in intelligent treatment is to do everything possible to distinguish the different varieties of functional dyspepsia and note any motor or secretory disorders by radiological examination or gastric analysis. Many of these dyspepsias, in none of which are there pathological alterations of the gastric mucosa, merge gradually into one another, and in general have many symptoms in common; this aspect must be taken into consideration. Treatment of a special nature consists in: (i) dietetic, (ii) symptomatic and medicinal, (iii) mechanical, (iv) general therapeutic, and (v) surgical measures.

Diet.

Dietetic treatment is most important. Due consideration must be given for any type of motor or secretory aberration and articles of food given that will be more or less easily digested in the face of such a disturbance. In dyspepsia associated with hyperacidity or hypersecretion, for instance, foods that are bland and combine well with hydrochloric acid, such as milk, eggs, proteins *et cetera*, or that tend to inhibit the gastric secretion, such as cream and fatty foods, would be indicated.

In anacidity or subacidity, on the other hand, we would inhibit fats and fatty foods, and encourage the stimulation of gastric juice by giving a small amount of meat extract or beef tea at the beginning of a meal; we would never give carbohydrate in the form of soft foods, but in a form requiring mastication, and we would give only small amounts with any protein meal. Finally, we should encourage the secretion by a careful consideration of the patient's idiosyncrasies in food. Orange juice, grape fruit or lemon juice or a glassful of hot water is to be recommended if gastric secretion is deficient.

If there is gastric atony or delayed motility, due consideration must be paid to the question of gastric

residue and deficient emptying time. Coarse foods must be avoided, while all food must be very well cooked and made soft; vegetables should be served as *purées*. In most cases, instead of the ordinary three meals of usual bulk, five small meals should be taken, at intervals of two and a half or three hours or longer (say, at 8 a.m., 12 noon, 2 p.m., 6 p.m., and 8 p.m., only fluids with some nutritive value, such as milk, "Ovaltine" and chocolate, being taken at 12 noon and 8 p.m.).

Milk is not always well borne; some people cannot tolerate it. Citrated or peptonized milk or milk and barley water may be tried; if these are not tolerated, a suitable substitute will be necessary.

The gastric neuroses usually persist independently of the quality, quantity or even the kind of food. As a general rule the patient should be persuaded to take a liberal, well balanced diet of plain foods of high caloric value, avoiding improperly prepared, rich and highly flavoured dishes.

The psychic effect of a diet must not be overlooked, particularly among less intelligent people; by giving a diet that is worked out on proper scientific principles from a careful consideration of symptoms, radiological evidence and, particularly, gastric analysis, we can kill two birds with one stone. In addition, there is always the danger that the omission to specify definitely the kind of diet advised may make the patient confused and fearful that certain articles of diet may be harmful to him, an important detail, of course, that will retard recovery if he is neuropathically inclined or introspective, as so many of these people are.

Symptomatic and Medicinal Treatment.

Treatment of the individual symptoms is most important. In this an exact knowledge of the motor and secretory processes with any departure from normal is necessary. Stomachic bitters, such as gentian, compound tincture of cardamom, calumba, and *nux vomica*, may stimulate the taste buds and by their odour and taste do a little to stimulate secretion when it is deficient. They are not greatly used and probably are not of much benefit.

For hyperacidity and hypersecretion alkalis are indicated. Usually they give striking and immediate relief; but they must be properly administered. Bicarbonate of soda, calcium carbonate, calcined magnesia, magnesium carbonate, and the bismuth salts, bismuth subnitrate, bismuth subcarbonate and bismuth oxycarbonate, are the ones most generally employed. Some are stronger alkalis than others. Magnesium carbonate is stronger than calcium carbonate, which, in turn, is three times as strong as bicarbonate of soda. In spite of this, however, and any objections that may be urged against it, such as its possible irritative effect on the kidneys when given in large doses, and its secondary stimulating action that aggravates the symptoms, in practice bicarbonate of soda is a most useful antacid, and if we neglected it altogether our results would suffer. In my own experience I have found the most useful method is to combine the various alkalis. The therapy should be as intensive as possible; but due regard must be had for any possible dangers such as might arise for instance, in a man of middle or old age, particularly if his kidney function were at all deficient. The intensity of administration will depend, of course, on the symptoms and degree of hyperacidity. If I use bismuth, and I think it a most valuable drug, I always give one single large daily dose, say, eight grammes (two drachms) or even more of bismuth subnitrate or bismuth oxycarbonate, about half an hour before breakfast.

Alkalis should be given in moderate doses at short intervals, these depending on the intensity of treatment; they should be given in water, never immediately after a meal, but about three-quarters of an hour to one and a half hours after the meal. A mild carminative oil, such as oil of peppermint, may be added to the alkali or given separately in water.

The next most useful antacid is belladonna or atropine. It is particularly useful in hypersecretion. Atropine may be given hypodermically in a dose of 0·65 milligramme (one-hundredth of a grain), or, better still, by mouth, in the same dose before each meal, in a mixture with bismuth or bicarbonate of soda. Tincture of belladonna may be given in a dose of 0·6 mil (ten minims) in an alkaline mixture before each meal; but I think better results are obtained by giving the same dose in a large tumblerful of water, drunk slowly an hour before breakfast, and at bedtime, to inhibit the night secretion, which is often troublesome.

Patients with anacidity are best treated with dilute hydrochloric acid and glycerin of pepsin. When hydrochloric acid is administered the mistake should not be made of giving too small a dose. If it is wanted at all, at least two mils (half a drachm) must be given. The dose may be gradually increased to four mils (one drachm), and in some cases even more. I think one of the best methods is to give it in a large tumblerful of water in divided doses, beginning about a quarter of an hour after the meal and not finishing for about an hour. It is combined with advantage with glycerin of pepsin. I think the old practice of giving some alkali before food, such as *mistura gentianæ alkalina*, is a good one, even though it seems foolish to give an alkali in a case of subacidity. Probably the administration of the alkali before a meal may excite some acid secretion; at any rate patients feel better for it. In addition, hydrochloric acid may be given after food.

For the relief of nausea and vomiting, cerium oxalate in a dose of 0·6 gramme (ten grains) with subnitrate of bismuth is often useful.

In the neuroses the simple bromide preparations, either alone or in combination with alkalis and belladonna, are among the most useful drugs we have for allaying nervousness. Chloral hydrate may be given as well to very nervous patients.

"Luminal" (phenobarbital) is another excellent drug that may be prescribed as such or in the less depressing form of "Sodium Luminal" It may also be given in a mixture if desired, as sodium phenobarbital or "Elixir Phenobarbital", along with belladonna, bismuth or sodium bicarbonate; if necessary, some bromide may be added. Valerian preparations are occasionally useful. But persons suffering from the neuroses are not generally aided to any great extent by medicaments. They present an entirely psychotherapeutic problem. Drugs are not of much use except for symptomatic relief.

Insomnia is often a very severe and at times a most intractable condition. Neurotic people must have sleep, otherwise there is no hope for them. The best drugs, perhaps, are the bromides, paraldehyde, trional and sulphonal, and the barbituric acid derivatives. The latter are especially valuable; but, as they tend to produce depression on the following day, they should be used as far as possible in an interrupted manner. I need hardly warn you against the danger of using morphine or opiates except very occasionally, and then only in emergency in this type of case.

Constipation is treated mainly by diet and exercise. If drugs are necessary, the best are senna, liquorice, rhubarb, phenolphthalein, any good paraffin oil preparation, or cascara, either alone or combined with belladonna and *nux vomica*.

Mechanical Measures.

Mechanical measures include the use of various abdominal supports or belts or strips of adhesive plaster. They are suitable for patients with marked enteroptosis. Some undoubtedly feel better with them; but there may be a distinct psychical factor. It is important to see that the belt is made properly and that support is given where it is required. The supports should be adjusted while the patient is lying down after he has rested for a short period with the foot of the bed raised. I use them, but I cannot say that I am enamoured of them.

A more important and more helpful mechanical measure in some cases is gastric lavage, which should be given at first daily and then twice or three times a week, and finally once a week, the length of treatment and the frequency depending on the progress of the patient, who may be taught to perform lavage himself, if necessary. If gastric motility is good, there is nothing but a psychic effect to be produced by washing out the stomach. In some neuroses, such as nervous vomiting, the effect of such a measure may be of great assistance. If there is any dilatation of the stomach or any definite delay in motility, such as may be seen in the primary and secondary forms of gastric atony and pylorospasm with stasis, particularly if any fasting contents in the morning bear evidence of retention of food taken the previous day, lavage is an excellent measure, which should be continued until all signs of stasis have disappeared and the stomach has regained some of its tone. The best solution to use is ordinary tap water at 21° to 27° C. (70° to 80° F.) containing a teaspoonful of common salt or bicarbonate of soda to the pint. In the treatment of pylorospasm it is a good practice to combine with this the administration of atropine or belladonna to the full physiological effect.

Surgical Measures.

The only surgical measures that concern us in a discussion on functional dyspepsias are operative procedures for dealing with reflex causes. Occasionally, when the symptoms are very severe and no form of internal treatment is effectual, gastro-enterostomy has been recommended for persons suffering from gastric atony or chronic gastrectasis. I have had no personal experience of this.

Other Measures.

Diathermy, applied over the stomach or epigastrium with one pole at the back, may be used. I cannot convince myself of any benefit that can arise from this form of therapy except a psychic one. It may be helpful in some cases of gastralgia.

Massage may be useful, particularly in nervous dyspepsia and some neuroses. Benefits from this may be enhanced by suitably regulated calisthenic exercises.

Exercise is most essential to prevent digestive disturbances, apart from the fact that it will assist to keep the bowels regular and prevent constipation. No exercise must be taken for half an hour at least after meals. Walking, golfing and swimming are excellent.

Change of environment, climate and scene, is often most beneficial, particularly in those forms of functional dyspepsia with debility, and anxiety neuroses associated with the worrying life of a busy professional or commercial man. Most of the benefit derived from a course of treatment at one of the spas or watering places on the Continent is due to careful regulation of diet and habits, along with change of air and scene.

Rest at times is necessary. Prolonged rest in bed, preferably in a hospital, may be required at the commencement of treatment. Some modified form of Weir Mitchell treatment may be advisable in some cases.

SUMMARY.

1. Functional and nervous affections of the stomach are considered as three main clinical groups: (*a*) true functional cases, including the dynamic disorders, characterized solely by disturbed motility or aberrations in secretion, either in quantity or quality; (*b*) functional disturbances that are merely reflex manifestations: (*c*) the gastric neuroses, the two main groups of which are the transference neuroses or psychoneuroses and the physioneuroses, also known as actual or somatic neuroses.

2. Ætiological factors must be clearly understood for successful therapy. These include mental and psychic factors, alcoholic excesses and sexual

abuses (especially masturbation), all of which play a part in weakening the constitution, especially the nervous system. Other causes are: malicious dietary habits, excessive or injudiciously chosen foods, mental excitement during meals, dental factors, and the excessive use of tobacco. Finally, trauma has to be considered if there is a possible traumatic neurosis.

3. Of all gastric disorders, at least 60% to 70% are non-organic. They are most common probably in the third or fourth decade.

4. The symptoms and signs of functional stomach trouble are variable. The chief symptoms are: pain or distress, nausea, vomiting, belching and flatulence, heartburn, epigastric fullness and substernal pressure, disturbances of appetite and hunger, constitutional and nervous symptoms in the shape of headache, cardiac palpitation, insomnia, lassitude, mental depression or irritability, and inability to concentrate, and, finally, certain vasomotor disturbances, as sweating, faintness, dizziness *et cetera*. As a general rule, actual pain does not occur; its absence helps to differentiate functional from organic disease. Vomiting, particularly if irregular, is, on the whole, more characteristic of functional disturbances of the stomach, unless there are signs of organic stenosis or pylorospasm. Headache is not a symptom of uncomplicated organic gastric disease. *Habitus enteropticus* is common.

5. Gastric analysis does not assist much in the actual diagnosis of a functional or nervous dyspepsia, excepting when there are bizarre curves not suggestive of any organic lesion. Fractional test meal curves, however, are most helpful in the matter of therapy.

6. Treatment is discussed. In the dietary forms and the reflex dyspepsias the main object of treatment is the removal of the cause. Hyperchlorhydria and hypersecretion are treated with alkalis and belladonna or atropine; dilute hydrochloric acid and pepsin are given for subacidity or anacidity. Bromides, "Luminal", and other sedatives are useful. In the transference neuroses the treatment should be along psychiatric lines, and in the physioneuroses symptomatic or somatic treatment should be added to any psychotherapeutic treatment.

ACKNOWLEDGEMENTS.

I am indebted to Dr. W. L. Calov for some valuable suggestions, also to Dr. A. J. Fitzgerald for drawing the fractional test meal curves.

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ANÆSTHESIA WITH PRENARCOSIS BY MORPHINE AND PARALDEHYDE.

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AND

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CASINO NOTO AND ROWBOTHAM,[1] and recently Thompson and Hartnett,[2] have made contributions in regard to basal anæsthesia produced by morphine and paraldehyde.

It is well recognized that, with local anæsthesia, the mental strain and fear of pain is as much, and possibly more, than that with general anæsthesia, and is, moreover, prolonged throughout the whole period of the operation. This mental strain is not something that can be lightly cast aside as being unfortunate but unavoidable, even with perfect analgesia. It was found that not only was it definitely a cause of prolongation of the period of convalescence, but quite frequently a mild degree of post-operative neurasthenia was produced. The applications of cocaine or the injections of "Novocain" caused distress, and the patients, though feeling no pain in the operation, remained anxious and apprehensive throughout the surgical procedure and returned to the wards exhausted and often in a state of mental distress. This was particularly noticeable in soldier patients, who are so frequently sufferers from war neurosis. It prejudiced them against further necessary operative treatment under local anæsthesia. These men insisted that they had felt no pain at all during the operation, but stated that they "just could not stand the thought of it again". Apart from that consideration, it must be our aim to reduce to a minimum all pain and terror to our patients and endeavour to make any unfortunately unavoidable operative treatment, if possible, even pleasant, or at least not a cause of mental anguish as well as bodily pain.

Rowbotham employs paraldehyde in conjunction with morphine and hyoscine. He advocates large doses of paraldehyde, up to 0·5 cubic centimetre per kilogram (one fluid drachm to each stone) of the body weight, and for the adult male gives morphine 0·015 gramme (a quarter of a grain) and hyoscine 0·6 milligramme (one one-hundredth of a grain). The method used in these cases for men is as follows.

An enema is given the night before the operation. This clearance of the rectum provides space for the injection, diminishes the possibility of rejection of the paraldehyde solution and assists absorption of the drug.

One hour before the time of the operation a hypodermic injection of morphine 0·015 gramme (one-quarter of a grain) and hyoscine 0·65 milligramme (one one-thousandth of a grain) is given. Fifteen minutes later, paraldehyde 0·25 cubic centimetre per kilogram (half a drachm for each stone) of body weight is dissolved in ten times its volume

of normal saline solution and injected slowly into the rectum. It will be found an almost inevitable rule that before this injection has been completed the patient falls into a heavy sleep, often with slight stertorous breathing. The general effect is that the patient arrives at the operating theatre snoring gently, and during the subsequent administration of the local anæsthesia by injection, as, for instance, into the branches of the trigeminal nerve, makes muttering noises and vague restless movements easily controlled by assistants. Sometimes, when the narcosis is not quite so complete, mild complaints are made of a vague kind, but these plaints rapidly cease on complete block of the painful stimuli and the patient again drifts off into a sleep. During the operative procedure it is very unusual for any complaint to be made, and these only occur at the time of bone crushing or chiselling. On completion of the operation the patient is returned to the ward still sleeping, and remains so for a variable period of one to four hours.

It is well worth noting that very much less cocaine or "Novocain" is required to produce the necessary local anæsthesia. It is anæsthesia *en gros* and not *en détail*.

On complete recovery from the effects of the narcosis the patient invariably confesses that, though sometimes having a hazy memory of the fact that something was done, yet he has no recollection of any pain and a complete absence of any of the usual pre-operative mental strain and anxiety. From a *questionnaire* taken from a great number of patients an overwhelming appreciation is offered and what may be termed a "plumping for" this method of anæsthesia over any other forms. Again, it has been found from the records of these cases that the period of convalescence is quite definitely shortened and that the patient's general health is not nearly as much affected as by operation under local anæsthetic alone.

It will be seen from the foregoing short description that this method of supplementing local anæsthesia has much to recommend it, but there are certainly a few drawbacks associated with it. The drugs used are recognized to be powerful and dangerous, and their administration must be in the hands of careful and trained nurses, and it is imperative that the patient should be under observation during the whole period.

Contrary to Hartnett's findings, from a careful routine examination it has been found that a decided and definite drop in blood pressure has occurred in every case. In all 143 cases have been dealt with and in 102 tested a fall of 15 to 20 millimetres in the blood pressure has invariably occurred. This factor is one to be considered, as it places certain cardiac patients, for example, those with coronary sclerosis, on whom it would otherwise be an ideal method, among risky subjects and among those few excluded from the benefits of this method.

Out of the 143 cases there has been so far one death associated with the method. It is aptly said, associated, for the reason that the case was one of gross tuberculous involvement of the larynx with obstruction to breathing, in which a tracheotomy was performed. This patient died of respiratory failure, having an associated tuberculous and bronchiectatic involvement of the lung and asthma, and attention should be drawn to this important fact. Paraldehyde, among the aldehyde group, is excreted for the most part through the respiratory system; and it has been found that those about whom any anxiety was felt were those patients with gross pulmonary involvement and consequent lowered respiratory exchange, for example, cases of generalized tuberculosis, with great fibroid changes or generalized bronchiectasis or silicosis.

A short detailed description of the effects and results of morphine, hyoscine and paraldehyde prenarcosis on a few of the patients who deviated from the usual is as follows.

1. A.B., a male, aged thirty-nine years, had a radical right antrum operation on an old gunshot wound involving the right maxilla. The usual prenarcosis was given; anæsthesia was by local block and maxillary trunk interruption. Hæmorrhage occurred from the right antrum three hours later. The right antrum was packed with gauze through the buccal opening. The patient cooperated, but next day had no recollection of either the operation or the subsequent packing.

2. B.C., a male, aged forty years, had gross pulmonary and laryngeal tuberculosis with bronchiectasis and asthma. Tracheotomy was performed for obstruction to breathing. Prenarcosis was used and no local anæsthetic was required. During the operation the pupils were dilated and insensitive. Some recovery occurred on completion of the tracheotomy, but the pupils remained dilated. The blood pressure fell to 70 systolic. Respiration failed three hours later, but the pulse was palpable three minutes after cessation of respiration. Death occurred.

3. C.D., a male, aged thirty-nine years, had marked generalized pulmonary fibrosis and bronchiectasis from suppurative sinusitis. Bronchoscopy was performed. Prenarcosis was given and cocaine was applied to the larynx. The pupils were dilated, the face was slightly cyanosed. He remained narcotized for twelve hours with a cyanosed face and shallow respirations. The systolic blood pressure was 90 and the diastolic 70 millimetres of mercury.

4. D.E., a male, aged forty-seven years, had coronary sclerosis and mild angina. His systolic blood pressure before prenarcosis was 110 and the diastolic 70 millimetres of mercury; after prenarcosis the figures were 90 and 60. Following a local radical antrum operation a further fall occurred to 80 and 60 millimetres. The pulse rate was 86 and of poor volume. He remained narcotized for ten hours and pituitrin was injected to maintain the blood pressure.

5. E.F., aged twenty-five years, was not a returned soldier. He had no alcoholic history. He was well narcotized in five minutes following prenarcosis. Practically no local anæsthetic was required for septal resection. He remained quiet during operation and was asleep for the next four hours. He confessed to no knowledge of anything having been done.

6. F.G., aged thirty, was not a returned soldier. He gave a history of a regular alcoholic intake. He was deeply narcotized for the first hour, but became restless at the end of septal resection and was noisy for two hours, but he had no knowledge of anything. Alcoholic patients require more paraldehyde.

The procedure adopted for females in private and hospital practice is similar. An enema is administered the evening prior to the day of operation; any necessary sedative to obtain a good night's rest is

given. One hour before the time of operation a hypodermic injection of morphine, 0·011 gramme (one-sixth of a grain), is given, and fifteen minutes later a rectal injection of paraldehyde, 0·25 cubic centimetre per kilogram (half a drachm to each stone) of body weight. The paraldehyde is dissolved in ten times its volume of normal saline solution. This is a useful yard measure. In elderly women the paraldehyde may be reduced by 2·0 cubic centimetres (half a drachm) and similarly increased in young and thin women. In a series of twenty-two operations, chiefly septal resections, local radical antra operations, polypus removals and bronchoscopies, there was one patient who was not sufficiently narcotized; she remembered the operation. Two had no memory of the operation at all, and the remainder had a faint recollection of seeing a light or being carried back to bed.

Much the same procedure has been carried out as a preliminary to a general anæsthetic. In adults of both sexes the preliminary injection was morphine 0·011 gramme (one-sixth of a grain) and paraldehyde 0·25 cubic centimetre per kilogram (half a drachm to each stone) of body weight. This was given the usual one hour before the time of operation. Thirty-six patients have been so treated. The operations were, with the exception of one radical mastoid, tonsillectomies. One heavy man was not asleep, but all the others did not wake while being carried to the theatre or during the induction of anæsthesia. There was a rapid passage through the struggling stage and a smooth induction, with somewhat less anæsthetic. On the completion of the operation and the return of the cough reflex they were returned to bed and remained asleep for a period of four or five hours. There was definitely less vomiting and it is beyond any doubt that patients so narcotized suffered less shock and had a quicker convalescence.

The strain of waiting for an operation, of facing the theatre and submitting to an anæsthetic requires a strong effort of will, and the fear of the anæsthetic and the operation is a tax on the bravest patient. And, as Crile shows, fear damages the Nissl bodies in the same manner as pain and anæsthesia. Any plan to abolish this strain and this fear, and which keeps the patient semi-comatose and drowsy for the unpleasant hours after the operation, is eminently worth while. It is, however, essential for the patient whose tonsils have been removed to be kept on the side and to be watched carefully till full consciousness returns. We have had no anxiety about any patient in this series.

Summary.

Morphine, paraldehyde and hyoscine, in suitable dosage, are of value as basal narcotics for operations under local anæsthesia.

Morphine and paraldehyde, as a preliminary to the induction of general anæsthesia, are useful in relatively short operations and tide the patient over the painful recovery period.

These drugs are relatively unsuitable for cases with much pulmonary fibrosis or coronary sclerosis.

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[2] J. L. Thompson and L. J. Hartnett: "Notes on the Use of Paraldehyde as a Basal Anæsthetic", THE MEDICAL JOURNAL OF AUSTRALIA, December 3, 1932, page 682.

Reports of Cases.

SUBCUTANEOUS EMPHYSEMA FOLLOWING OPERATIONS ON THE NOSE AND THROAT.

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THE first occurrence, in my experience, of subcutaneous emphysema following operation on the nose and throat occurred in 1925. Operation for the enucleation of tonsils by dissection was carried out on a woman of thirty-three years, under intratracheally administered ether. The patient was of robust type, with a rather thick neck. There was a long history of recurring tonsillitis and one quinsy. Induction by ethyl chloride-ether and the passing of the intratracheal catheter were normal, but it was then found that the patient was very susceptible to ether. An average mixture rapidly caused cyanosis and shallow respiration, whilst recovery when she was put on full air was rapid. The tonsils were enucleated normally, except that the tonsil on the left side was adherent, superiorly, probably due to the previous quinsy. When the patient was seen, twenty minutes after being returned to bed, there was still slight cyanosis, and bilateral swelling of the neck was noted. This, on examination, was found to be a subcutaneous emphysema, and extended round the whole neck and anteriorly below the clavicles for two to three inches. The emphysema appeared to increase for the next half hour, but then very gradually subsided. All traces had disappeared in four days, and convalescence was uneventful.

My second case occurred recently. The patient was a boy, aged twelve years, with a history of bronchitic attacks since infancy with, lately, definite bronchial asthma. At operation, under normal intratracheally produced anæsthesia, the infected right antrum was opened, first intranasally. As polypoid tissue could be palpated in the antrum, exposure was then made through the canine fossa and the diseased mucosa removed under direct vision. Adenectomy, with a La Force adenotome, was next carried out. No packing was necessary in the antrum. Immediately after operation, subcutaneous hæmorrhage was noted in the right lower eye lid, and this appeared to be increasing rapidly in size. The actual time of onset of this was not certain, as the eyes had been covered with a sterile towel, but it appeared to be commencing when noted. An ice pack was applied, and the patient was returned to bed. Twenty minutes later the sister reported swelling of the right temple, and examination revealed surgical emphysema of the right temple and bilaterally in the neck anteriorly, which was not directly connected with the temporal lesion. This emphysema increased very slowly for two hours, the temporal swelling extending to the occiput and the neck laterally. It then gradually subsided, until no emphysema was present after the third day. The ecchymotic swelling rapidly subsided, but discoloration was evident until the eighth day. No apparent trauma had been inflicted on the bone, in the area of the antral roof, but the whole diseased mucosa had been carefully removed from the antral wall. One would consider that the blood effusion would have been an effective block to air reaching the tissues of the temporal region, and

that if it did come from this area emphysema would have been noted at other areas close to the ecchymosis. The neck emphysema might have occurred during operation, but the temporal emphysema definitely did not. The intratracheal tube had been withdrawn ten minutes before the patient left the theatre, and this apparently had no part in the causation of the temporal emphysema.

Study of the literature revealed some twelve cases reported, following tonsil operation, and three of these, reported by F. H. von Hofe,[1] occurred using guillotine technique. Three other cases are reported. In the first A. S. Woodwark[2] reported occurrence of emphysema following a traumatic perforation of the soft palate, just above the anterior pillar of the fauces, by a broken pipe stem. The other two were reported by G. Ewart Martin[3] and E. A. Dalziell Dickson.[4] Emphysema of the face occurred in normal persons after violently blowing the nose. Subcutaneous emphysema is also a recognized complication in fractures at the base of the skull.

Insufflation anæsthesia was used in all tonsil cases reported, but whether this had any bearing on the causation is uncertain, and the fact that the emphysema in my cases continued to increase after cessation of anæsthesia leads me to the opinion that the type of anæsthesia has no bearing. Exposure of the subcutaneous tissues in the air passages seems to be the only constant factor.

This complication is apparently not uncommon. It apparently always subsides completely and does not interfere with convalescence. All previous reporters agree that the air reaches the subcutaneous tissues in the tonsillar cases through the tonsillar bed. It is very hard to conceive how this is possible.

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[4] E. A. Dalziell Dickson: "Emphysema in the Left Orbit of Nasal Origin", *The Journal of Laryngology and Otology*, May, 1928, page 341.

A CASE OF POLIOMYELITIS.

By W. KENT HUGHES, M.B. (London), M.R.C.S. (England), *Melbourne*.

THIS case is of interest from the success of diathermy and from its being the earliest recorded case of *genu valgum* in poliomyelitis.

I.T., aged nineteen months, was seen on October 8, 1932. All the muscles of the lower limbs and of the trunk, except the respiratory muscles, were flaccid. The baby was bright and intelligent. A diagnosis had been made of Oppenheim's disease (see Figures I and II).

Up to ten months he seemed normal, then, after a few days with a temperature of 38·3° C. (101° F.) and thereabouts, he began to lose the use of his muscles. He was put under the care of Miss Gundersen, for whose skilful management I am much indebted. At the end of December he can sit up by himself with only a slight kyphosis. He can flex fully both his thighs without assistance and against a slight resistance; and he can extend them with a little assistance.

The muscles of the right leg have improved much more than those of the left. Both quadriceps are still weak, and the abdominal muscles are lagging far behind. When I first saw him the dorsal flexor of the right hallux was the only muscle in the lower limbs that seemed definitely active.

Comment.

In the excellent symposium by the members of the Brisbane committee there is no mention of diathermy. I would refer them to the work of Bordier, of Lyon, in case they think this may be the vapid outpouring of a diathermy crank.

I was glad to note the confirmation of my suggestion to the Victorian committee (1925) to use serum even if paralysis had set in, provided a febrile condition was present. It is, of course, impossible to say what would have happened in the successful cases if serum had not been used, but as it gives such definite results in monkeys when a prophylactic dose is administered, I cannot understand the reaction against its use in several places.

FIGURE I.
Baby lying down, showing *genu valgum*.

The praise given to Dr. Morgan's work by Dr. Duhig cannot be too highly estimated. To him and to Dr. Burnett the Victorian committee owe whatever success has been obtained. We supplied the machinery, they supplied the power, and Dr. Macnamara and Dr. Southby efficiently produced the results. May I once again emphasize the success of municipal control of poliomyelitis? Of course, we were lucky in Melbourne in having the help of Dr. Dale, and the ready cooperation of Alderman Stapley, the Chairman of the Health Committee. Although thousands

FIGURE II.
Baby leaning over couch, showing well marked creases on the right leg, slight on the left.

of pounds have been spent, we have never once been hampered by the want of funds. The State Government has always done its share without hesitation. This year the expenses have been very small, owing to the small number of cases. Inquiry into the efficiency of pooled adult serum has been our chief expense. If this be proved, I hope in the near future that in every doubtful case the medical practitioner, who may be far distant from the

assistance of specialists or not within reach of prepared serum, may see fit to prepare a serum from the patient's relatives and inject it intramuscularly.

The extended period of rest is now almost universal. I well remember when two weeks was considered ample, and the scorn with which my suggestion, in 1908, was received, that the period of rest should be measured in terms of months and not days. Some sixty years ago T. S. Ellis, in his monograph, "The Human Foot", pointed out that midway between the extreme limits of movement was the best position to obtain rest for the muscles of a joint. This important point is still missed, and we still see shoulders and feet splinted at right angles.

I am sorry Dr. Meehan has given up the subcutaneous division of the *tendo Achillis*. After forty-three years' experience I am convinced no other method is so satisfactory. The Z-shaped operation appealed on theoretical grounds, but after getting two weak results I abandoned it.

Reviews.

LIPIODOL.

THE appearance of an English edition of Sicard and Forestier's book on lipiodol cannot fail to insure a wider appreciation of the work of these two eminent French investigators.[1] It has been said that their contribution to the enhancement of X ray diagnosis is second in importance only to the discovery of the X ray method itself. A perusal of this book might readily confirm the claim.

First, the book deals exhaustively with the nature, action, elimination *et cetera* of the substance. Its innocuousness, of which misgivings were early expressed, more particularly with respect to its action on the central nervous system, has been established beyond all doubt. Probably, as the authors point out, the deterioration of the lipiodol—and this is no uncommon occurrence—is responsible for most of the reported mishaps; so that their contention may be accepted that, with the single exception of active pulmonary tuberculosis, nothing contraindicates its use, provided extreme susceptibility to iodine is not present in the subject. It was as a delineator of the spinal theca that lipiodol had its first and most signal triumphs. Neurologists, with hardly an exception, acclaimed it as an aid to cord compression diagnosis of which the value could scarcely be exaggerated. Difficulties in interpretation naturally led at first to many reports of its questionable reliability as a precise diagnostic method, and not the least valuable chapter of the book is devoted to detailed discussion of equivocal or even what appeared to be misleading lipiodol findings.

The folly of divorcing lipiodol investigation from exhaustive neurological examination is strongly emphasized, and much sound advice is given for the adjustment of discrepancies that often arise between the findings of the old and of this new ancillary method.

Fortunately, just one year before, cisternal puncture had been made familiar to us by Ayer and so the route of delivery of the lipiodol was less doubtfully accepted. Later, to obviate cisternal puncture or to outline the lower contour of the compression area, a light (or ascending) lipiodol was devised for delivery by the lumbar route. It is questionable whether this can replace the heavy (or descending) lipiodol, but certainly very beautiful pictures of spinal tumours have shown up by their combined use.

As regards cisternal puncture, some would take exception to the initial directing of the needle to the occipital bone at the margin of the *foramen magnum*, preferring to make straight for the objective, keeping three points in alignment—upper edge of spine of axis, outer margin of external auditory meatus and the glabella—observing, of course, at the same time an exact mesial plane.

It may be emphasized that, simple as the procedure is, the operator should make himself familiar with the land-marks, as well as the thrust of the needle through the occipito-atlantoid ligament, in the cadaver.

Success in spinal lipiograms encouraged Sicard and Forestier to proceed to a similar illumination of the bronchial tree, and though not the actual pioneers in the use of contrast media in this direction, very intensive studies in lung pathology began with the introduction of lipiodol; and surely nothing is more striking than the way the surmises of unaided X ray lung pictures have given place to the certainties of lipiodol diagnoses. Here, as in spinal work, there are pitfalls in the delivery of the medium and in interpretation, and the authors, while advising the study of normal lung lipiograms in the cadaver by Garcin, but more particularly those by Sergent and Cottenot in the living subject, give many helpful pictures of lung lesions, with copious suggestions in technique and diagnosis.

Some intriguing questions of lung physiology, which may some day prove of clinical value, were brought to light in course of routine examination; for example, the movement of the bronchial tree in respiration, the questionable rhythmic bronchial contractions, the method of fluid distribution on coughing. As regards the method of introducing lipiodol, there is no best way. There may be, the authors point out, the best way for a particular case, or the way the operator knows best; for example, in Ballon's hands bronchoscopic topical disposition is the method *par excellence* in lung excavation. The supraglottal method of Singer has many enthusiastic exponents and with practice quite surprising results may be obtained. It is of all methods the least disturbing to the patient. The general practitioner is content with Sicard's own original procedure—cricothyreoid membrane puncture. While the authors favour this direct method for children, many prefer a general anæsthetic and the introduction of a metal-tipped catheter through the glottis.

Soon, other cavities, sinuses *et cetera* were explored with equally good results. In the case of the genito-urinary tracts, possibly for economic reasons, other media, such as sodium iodide, are in more common use in hospital practice.

Turning to lipiodol as a therapeutic agent, it is pointed out that, in spite of its apparent lack of germicidal properties, a fat-splitting ferment in suppurating cavities may slowly release the iodine with beneficial effects. Be that as it may, it is significant that almost all who use lipiodol purely as a diagnostic agent are impressed with the amelioration of the lung condition that quite frequently follows. In many clinics repeated instillation of lipiodol has become the routine treatment of bronchiectasis. But it is as an antineuritic that its therapeutic reputation appears to the authors to be assured. Epidural instillation of lipiodol for lumbo-sacral pain of all kinds, perineural infiltration, as a protective lining in painful amputation stumps, all are here successfully demonstrated. One has to remember that epidural delivery and perineural infiltration of quite inert substances, as sodium chloride, are occasionally equally effective. Indeed, the authors are candidly nonplussed as to the particular action of lipiodol. We follow Sicard and Forestier with some trepidation in their bold intraarticular use of lipiodol. Here severe reactions may occur, but numerous examples are given to show that on the subsidence of the lipiodol disturbance there is marked improvement in the joint condition, in some cases amounting to a complete cure.

A full bibliography completes a book that is rich in the highest forms of clinical experimental medicine, resulting in large additions to our armamentarium of diagnostic and therapeutic methods, and full of stimulating suggestions for breaking new ground.

The letterpress, illustrations and general lay-out of the book are of the usual high standard expected of the Oxford University Press. One word of regret: Sicard died before its completion, leaving his sorrowing pupil and collaborator to put the finishing touches to the work of the master.

[1] "The Use of Lipiodol in Diagnosis and Treatment: A Clinical and Radiological Survey", by J. A. Sicard and J. Forestier; 1932. London: Humphrey Milford (Oxford University Press). Royal 8vo., pp. 244, with illustrations.

The Medical Journal of Australia

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BIOLOGY AND ITS PLACE IN EDUCATION.

DIVERGENT views are held regarding education. To many people education implies going to school. They say glibly: "He was educated at So-and-So School." Girls belonging to families of a certain type are sent to so-called finishing schools, schools which probably blot out any glimmerings of intelligence of which they might in their earlier days have given evidence. When a boy or girl leaves school, his or her education is in the eyes of many people complete. These people would turn out these completely educated young men and women into the world to fend for themselves, or else they would allow them to live a life of laziness on the wealth of their parents, giving nothing to the world for its betterment and absorbing nothing from it to improve themselves. Fortunately for many of the young, they see that they must stand up to the knocks of the world, and they develop themselves along more or less satisfactory lines; their progress is often made in spite of their parents and guardians.

One of the main objects of school education is to teach children to think. For this reason the view that they should spend time only on those subjects which will be of material benefit to them in earning their living is foolish. When children leave school their mental development should be such that they are able with little difficulty to learn a trade or to begin study for entrance into the ranks of one of the professions. Since school education is not merely utilitarian, but concerned with intellectual development, it follows that the subjects chosen for school study should be those most likely to widen the outlook and deepen the understanding. In other words, education as a whole must be built on a solid foundation. Too often the superstructure is set up on an inadequate foundation, and sometimes the placing of the roof is attempted with the slenderest of supports to sustain it. Thus we may have knowledge in the sense of being aware of certain happenings and we may have knowledge with understanding. Again, both knowledge and understanding may lead to a restless striving for further enlightenment. It is people with knowledge of the last-mentioned kind, those with "the thirst to know and understand, a large and liberal discontent", who rise to the highest peaks, and from amongst whose ranks the visionaries and leaders of the human race have invariably come. To discuss this kind of knowledge would be most fascinating, but the temptation must be resisted, for we are concerned at the moment with people of a lesser order.

True education cannot be standardized. It could be standardized only if human beings were made after a standard pattern or after several patterns, to be pigeon-holed according to type soon after birth. Certain general principles, however, can be laid down. Education should aim not only at knowledge of certain happenings (in these circumstances it degenerates into mere instruction), but at understanding. If young people are to be able to cope with life, they should be able to take an intelligent interest in it. They should *inter alia* be able to realize what is going on around them in the world of plants and animals. They will gain this by a study of biology. Biology will teach them something about the development of life and will bring them at least as far as the gate beyond which lies the possibility of higher development within themselves. Of course, biology alone will not suffice, but

it is a science, fundamental and therefore indispensable. The complementary studies need not be considered at present.

It is remarkable that biology is not more widely taught in schools. It appears most often in the curricula of girls' schools and, when it is taught, it is more often than not presented as an emasculated form of physiology. But teaching of biology in schools is shackled by dogma and made subservient to prudery. As an amusing example may be quoted the horror of the principal of a well-known Australian girls' school when she heard a member of her staff telling the pupils that, if there were such beings as angels, they would certainly look like pouter pigeons, because their sternums would have to be prominent to afford space for attachment of the enormous pectoral musculature necessary to the proper functioning of the angelic wings. As far as prudery is concerned, it would be safe to say that almost nowhere is adequate instruction on sex given in the biology class. But this is a side issue. What is needed is the inculcation of biological principles, a general view of biological science in relation to the cosmos. If, as an addition to the other subjects in school curricula, teaching in biology were followed by an elementary course in psychology, the young people of Australia would be better equipped mentally. They might not be better citizens on that account, for good citizens are so called as a rule because they accept established customs and social standards without question; but they would be sufficiently enlightened to recognize the trend of modern social development. They would also, if they set themselves to it, be likely to gain some personal satisfaction from what is often the arduous task of living.

Current Comment.

VITAMIN C AND PEPTIC ULCER.

ALL the clinical and experimental evidence obtained up to the present on the subject of the origin of peptic ulceration suggests that there is no one single cause. Even if any single factor can be proved to be of prime importance, it does not follow that it is by any means solitary. It is, of course, obvious that diet should be carefully inquired into as having a possible ætiological significance. Also, as vitamins have been one of the most popular fields for the experimental pathologist, it is natural that a vitamin deficiency should be thought of as a possible cause of peptic ulcer.

David T. Smith and M. McConkey have recently pursued an investigation on these lines.[1] In reviewing the relation of diet to peptic ulcer, they note the considerable increase of this lesion in countries where food deprivation occurred during the World War. Seasonal variations have also been found in the incidence of gastric and duodenal ulcers both in man and animals. Other investigators have observed ulceration in the upper alimentary tract of animals whose dietary lacked the vitamin *C*. Smith and McConkey followed other workers in using guinea-pigs for their experimental work. The animals were bred in the laboratory and maintained on a satisfactorily balanced stock diet, on which spontaneous peptic ulcer did not develop. The controls were adequate, for routine autopsies on one thousand guinea-pigs did not reveal one instance of gastric or duodenal ulceration. Series of experiments were carried out with animals fed upon diets deficient in vitamin *C*; deficient in vitamins *A*, *B* and *D*, but adequate in *C*; and also exactly corresponding to the first series, but with vitamin *C* added. Out of 75 guinea-pigs fed on diets lacking in vitamin *C*, 20 developed ulcers in sites similar to those observed in human beings suffering from gastric or duodenal ulcer. The gross and microscopic appearances also tallied with the human variety of ulcer. One out of 80 control animals having an identical diet *plus* vitamin *C* was found to have peptic ulcer. Attempts to produce ulceration with a dietary lacking in vitamins *A*, *B* and *D*, though adequate in *C*, entirely failed. Further, a series of animals was subjected to operation whereby mechanical damage was inflicted upon the stomach and duodenum. In the scorbutic animals ulceration occurred, whereas in adequately fed animals the trauma was soon effaced by complete healing.

This work seems to indicate the importance of vitamin *C* in this connexion. The association with trauma is interesting, inasmuch as it is evidence of dual causation. Avitaminosis *per se* might not always cause ulceration, but when trauma was added a lesion of the mucosa and submucosa occurred. These authors have made a previous communication on the subject of the bearing of vitamins on tuberculous ulceration of the intestine, and they remark that the routine dietary of the New York State Hospital for Incipient Pulmonary Tuberculosis contains cod liver oil and tomato juice. They do not suggest that the addition of vitamin *C* to a diet will cure peptic ulceration, but that "it might be advisable to supplement the Sippy or Lenhartz diet with tomato or orange juice and cod liver oil". When one reflects upon the kind of dietary given to patients suffering from peptic ulceration, it becomes evident that it would not be difficult to neglect the vitamin factor. In fact,

[1] *Archives of Internal Medicine*, March, 1933.

when placing a patient on any modified dietary it is not always easy to preserve the balance of the necessary mineral and accessory factors in addition to making up caloric requirements. Therefore it would seem reasonable and desirable, in fact necessary, to attend to this point. Furthermore, the harmful effect of a deficiency of vitamin *C* upon the digestive tract is felt only when a deficiency has existed over a prolonged period of time. To make these statements is to assume that the analogy may be drawn with animal experiment. It is not always safe to argue from animal to man, but surely it may be confidently stated that when a patient is placed on a restricted diet, such as is often used for digestive disorders, it is desirable to insure that the accessory food factors are available and adequate.

PITUITARY BASOPHILISM.

THE size of an anatomical structure is not by any means a measure of its importance. Of course, the sheer bulk of the liver would *per se* indicate that it had much more important functions than the manufacture of bile, and the rise of the neopallium in phylogenetic development suggests at once the vast gap between the highest of mammals and the more humble members of the family. But it would be very unsafe to argue a relative unimportance for any small organs, or even for any small constellation of cells. Harvey Cushing, in his characteristically pleasant and lucid style, points this out in regard to the parathyreoid gland. He writes: "No moonshiner, with every effort to throw searchers off the track, ever secreted the spot where his demoralizing product was being distilled and prepared for distribution more skilfully than Nature has done, in the case of that remarkable disease, deforming *osteitis fibrosa*." He further points out, in the course of an interesting address on pituitary disorders, that there is reason to believe that the basophilic elements of the pituitary body produce a secretion of surprising potency.[1] This conclusion we may safely accept in the light of present knowledge of the extraordinary effects produced by an adenoma of these basophile cells.

The chromophobe adenomata of the pituitary gland do not possess a secretory activity that is clinically recognizable, and their harmful effects are those of local pressure. But the chromophile tumours resemble those of the thyreoid, parathyreoid, islets of Langerhans, and the adrenal cortex, in the extraordinary changes wrought by an excess of their secretion.

Cushing's address is on the same subject that he chose for a similar occasion over twenty years ago. He deals with effects caused by the various tumours of the pituitary body, but the most interesting part of the address, because it deals with recent discoveries, concerns the basophile adenomata. These tumours produce a remarkable clinical condition, and this may be described as a polyglandular disorder frequently associated with a pure pituitary basophile adenoma. The syndrome cannot be considered to be completely worked out yet, for no case record can be accepted as indubitable evidence unless convincing autopsy records are available. Moreover, other endocrine disturbances, such as those of the adrenal, apparently evoke similar states, therefore some caution is necessary in making a diagnosis. The outstanding signs and symptoms are adiposity, vascular hypertension, increase in the blood cholesterol content, osteomalacia, glycosuria, hypertrichosis and curious atrophic striations of the skin. (As is the case in other clinical syndromes, all these symptoms are not necessarily present in all patients.) The patients become plethoric in appearance and are very hirsute. In women abundant hair grows on the face. The obesity does not affect the limbs to any marked degree, but the abdomen becomes large and pendulous, with cutaneous striæ, which are also noticed on other parts, such as the limbs. Young subjects show precocious adolescence. The bony changes are associated with an increased calcium elimination and are due to skeletal decalcification, though this apparently does not always occur. In older persons the sex activities show waning or cessation. The metabolic rate is lowered. A study of this extraordinary syndrome shows that several endocrine factors are involved. Hypertrophic changes in the adrenal cortex have been noted in the majority of cases, and in several also enlargement of the parathyreoids has been recorded. But as Cushing has collected fourteen verified cases, there seems to be no doubt that the complex symptoms are due to the disturbing influence of the proliferating basophile cells of the anterior portion of the pituitary body.

Cushing points out that there is some reason for believing that the basophile secretion may also unduly activate or stimulate the neurohypophysis. The close connexion of the hypothalamic nuclear apparatus and the glandular elements of the pituitary body is now well recognized, and this suggestion is in keeping with present knowledge. The author remarks modestly that however much all that he has said regarding these adenomata and their secretory effects "may be fact and how much may be fancy, we may be sure that in the course of time the greater part of it will be modified out of all recognition". Whether this forecast unduly depreciates his own contributions to a subject that he has adorned remains to be seen. But there can be no doubt that much remains to be learnt about the workings and interworkings of these secretory "stills". Every student of medicine owes to humanity some contribution to the total sum of knowledge; the contribution of most must perforce be insignificant. But if it be merely the recognition of an unusual or significant morbid state, if it be but the placing of a patient with mysterious symptoms in the hands of those able and willing to pursue further a difficult investigation, that contribution will thereby have been made.

[1] *Archives of Internal Medicine*, April, 1933.

Abstracts from Current Medical Literature.

MORBID ANATOMY.

Glomerular Lesions Associated with Endocarditis.

E. T. BELL (*The American Journal of Pathology*, November, 1932) has investigated glomerular lesions associated with endocarditis. He has classified endocarditis into two groups, rheumatic and bacterial. He subdivides the bacterial group into acute and subacute primary and into secondary forms. He studied 104 cases of rheumatic and 233 cases of bacterial endocarditis. Two forms of glomerulitis, diffuse and embolic, are found in association with endocarditis. Diffuse glomerulitis was found with the various types of endocarditis as follows: acute rheumatic, 22·2%; acute primary bacterial, 28·6%; subacute bacterial, 64·8%; secondary acute, 33·3%. The extent of the capillary obstruction is much less than in clinical acute glomerulonephritis, but in seven instances of subacute endocarditis had reached the clinical level. Diffuse glomerulitis bears some relation to the intensity and duration of septicæmia. Embolic or focal glomerulitis was found in the different forms of endocarditis as follows: acute rheumatic, 2·9%; acute primary bacterial, 7·1%; subacute, 52·8%; secondary acute, 5·8%. In one instance there was no endocarditis. Two distinct types of embolic lesions occur, fresh hyaline and fibrous. The hyaline lesion is not an infarct, but a thrombosis and necrosis of capillaries resulting from the lodgement of bacteria. The fibrous lesion, like the fresh hyaline, may involve one or more lobules or the entire glomerulus. It develops independently of the fresh hyaline lesions. The fresh hyaline embolic lesions develop earlier than the fibrous and may be found at any time during the course of the disease. The frequent absence of embolic lesions in typical clinical examples of subacute bacterial endocarditis has not been explained. Diffuse glomerulitis is frequently found in association with embolic lesions.

Diffuse Polyposis of the Stomach.

NEIL SINCLAIR (*The British Journal of Surgery*, April, 1933) reports a case of diffuse polyposis of the stomach. The patient was a woman, aged fifty-seven years, whose symptoms were those of a chronic dyspepsia on which had been grafted the more acute symptoms of persistent vomiting and diarrhœa. At operation an hour-glass stomach was discovered. The condition was not recognized until the specimen had been removed at operation. The microscopic appearances suggested that chronic inflammation had produced polypous thickening of the gastric mucosa. There was no evidence of malignant change. It is generally agreed that polyposis of the stomach is not commonly associated with carcinoma. In one series the two conditions were present in 12% and in another series in 4·9% of cases. This is in contrast with the colon and rectum, in which the association has been computed to be as high as 75%. The author points out, however, that Stewart regards polyposis of the stomach as a precancerous lesion.

Plasma Cell Mastitis.

FRANK E. ADAIR (*Archives of Surgery*, May, 1933) describes ten cases of what he calls plasma cell mastitis. He states that the object of his report is: (i) to establish the condition as a distinct clinical disease among mammary lesions, (ii) to place the diagnosis on a more clean-cut basis, and (iii) to prevent the performance of grave and possibly unnecessary operations. The lesion is difficult to distinguish from mammary cancer by clinical signs alone. The tumour is hard, the nipple is retracted, the skin is attached, there is a *peau d'orange* appearance, and the axillary glands are enlarged. The typical history is that at some previous time an inflammatory process was present in a non-lactating breast and that this process was accompanied by redness, mild tenderness and mild discomfort. As the symptoms of the acute phase pass off, a residual hard mass remains. Although the lesion has most of the signs of a mammary carcinoma, the author has found that it can be diagnosed clinically. The microscopic changes are puzzling; at times the lesion closely simulates comedo-carcinoma, and at other times tuberculous mastitis. The lesion is a precancerous one.

Congenital Epulis.

D. STEWART MIDDLETON (*Edinburgh Medical Journal*, May, 1933) reports a congenital epulis which occurred in a female infant. He describes the histological appearances and discusses the nature of the tumour. The tumour cells did not exhibit a true epithelial mosaic arrangement and showed no organoid patterns. Blood vessels coursing throughout the tumour were plentiful and formed part of the tumour tissue. The author points out that this is not a feature of an epithelial, but of a mesoblastic structure. The chief component cells are regarded by the author as resembling cells found in other structures acknowledged to be of mesodermic origin. Special stains brought out very well the fine connective tissue supporting framework of the tumour cells. The author believes that the tumour had a mesodermic origin. He rejects the view that the tumour is a new growth from or a maldevelopment of the enamel organ or any part of the gingival epithelium allied to that organ. That it may be of dental origin is in no way excluded by this view; if it be of dental origin, it would be affiliated with the class of tumours arising from those elements which constitute a dental papilla. That it arose from a maldevelopment of the musculature with degenerative changes appears to the author improbable, and he could find no evidence of neural origin.

The Pathology of Sudden Death.

T. H. B. BEDFORD (*The Journal of Pathology and Bacteriology*, May, 1933) has reviewed the causes of death revealed at autopsy in 198 cases "brought in dead". The chief causes of death were coronary artery disease in 80 cases, valvular disease of the heart in 35 cases, aneurysm of the aorta in 22 cases, disease of the respiratory organs in 19 cases, and cerebral hæmorrhage in 15 cases. The coronary arteries were found diseased in 104 instances. In 15 cases *post mortem* examination failed to reveal any lesion which might have accounted for death. The period covered by the investigation was thirty-one years, and the author points out that during this time there has been a steady increase in the number of cases "brought in dead". The author concludes that this increase is a general one, affecting to an equal degree the incidence of sudden death from all causes.

Iron and Hæmochromatosis.

CYRIL POLSON (*The British Journal of Experimental Pathology*, April, 1933) has investigated the results of the prolonged administration of iron to rabbits. The periods of administration varied from one to four years, and the iron was given by the subcutaneous and intraperitoneal routes in the form of dialysed iron and in doses of five and ten cubic centimetres. The terminal iron content of the liver in ten rabbits ranged from 3·42% to 7·67% and averaged 5·19% dry weight. Liver cirrhosis and pancreatic damage were absent from all. The author states that excess of iron in the body over long periods caused neither liver cirrhosis nor hæmochromatosis in rabbits, and he regards it as unlikely that excess of iron is responsible for the hepatic and pancreatic lesions of human hæmochromatosis.

MORPHOLOGY.

Living Rat Eggs.

F. GILCHRIST AND G. PINCUS (*Anatomical Record*, October, 1932) describes a method of recovering living rat eggs, and records a series of interesting observations made on the size of ova before and after fertilization, reaction of follicle cells, cleavage *et cetera*. They state that fertilized rat eggs may usually be obtained without vasectomy by removing the female from the male after the first copulation. They find that unfertilized eggs may remain in the Fallopian tubes surrounded by follicle cells until at least twenty-three hours after copulation. The follicle cells surrounding fertilized eggs are dis-

persed at fertilization. Ovulation may occur as early as eight and a half hours after copulation, and the first cleavage comes between twenty-seven and forty-two hours after copulation. The average size of the fertilized unsegmented egg is about 71μ by 76μ. There is probably not much change in size through the first three cleavages, and the two cells resulting from the first cleavage are slightly unequal in size. At the time of fertilization there is a shrinkage in volume of the egg of about 13% to 17%, and eggs placed *in vitro* with either dead or living sperm show a shrinkage comparable to that occurring *in vitro*. There is a rapid dispersal of the follicle cells of eggs placed with live sperm *in vitro*. This is not so marked when dead sperm are used, and no dispersion at all occurs in incubated eggs without sperm.

The Human Pineal Gland.

E. COOPER (*Journal of Anatomy*, October, 1932) made a complete study of the pineal gland from the second fœtal month through childhood to old age, in an endeavour to elucidate the origin of cysts. From the observations made the author attempts to show that cystic enlargement of the pineal gland may be an exaggeration of the normal occurrence rather than a pathological entity. She finds also that the cellular types in the human pineal gland are two in number, (i) parenchyma and (ii) neuroglia, apparently belonging to the astrocyte group. No nerve cells were observed. Proliferation of the glia was seen to occur at puberty. With regard to the lime concretions, or "brain sand" in the pineal body, it is suggested that the lime salts are deposited in the parenchyma cells which afterwards disintegrate and set free the calcareous mass, and that they may represent retrogressive changes consequent upon advancing age.

The Course and Distribution of the Circumflex Arteries in Man.

D. SHEEHAN (*Anatomischer Anzeiger*, December, 1932) gives an account of the more usual course and distribution of the circumflex arteries in the human upper and lower extremities, and notes the more important deviations from the usual course. He also discusses the surgical importance of such anomalies. The course of the circumflex arteries in contrast to their variable origin is very constant. The current description of the lateral circumflex artery of the thigh dividing the anterior crural nerve into superficial and deep divisions has been shown to be inaccurate. The artery in almost all cases was found to divide into two rather than three branches, and this description is supported by a study of the development of these vessels. The anastomoses between the circumflex arteries are much more numerous in the thigh than in the arm. Great similarity in course and function between the circumflex arteries of the upper and lower extremity is clearly illustrated in the present study, and these arteries, both in the arm and thigh, were shown to fill a very important rôle in the collateral circulation of the limb. The author shows that it is clear from an embryological study that these arteries are not homologous.

The Unmyelinated Fibres in the Spinal Nerves.

D. SHEEHAN (*Anatomical Record*, Volume LV, 1933) reviews the evidence for the presence and probable functions of the non-medullated fibres in the spinal nerves. The non-sympathetic origin of many of these fibres is confirmed and an explanation of a possible relationship between these non-myelinated fibres and the spinal parasympathetic system is put forward.

Activities of Amœboid Growth Cones.

C. C. SPEIDEL (*American Journal of Anatomy*, Volume LII, 1933) gives an account of observations made on the amœboid action of the growing tips of single nerve fibres in living animals (frog tadpoles). In general appearance and mode of movement they closely resemble the growth cones of nerve cells cultivated *in vitro*. The first growth cone advances through the mesenchymal tissues in a peripheral direction, spinning the nerve fibre behind it. A slight temporary obstruction to the growth cone may result in the formation of a varicosity, while a more formidable obstruction may lead to the formation of a giant growth cone or to the formation of branches *et cetera*. Mitoses either of sheath cells or of fibroblasts appear to have a stimulating effect on adjacent growth cones. Active growth cones may travel about 200μ in twenty-four hours. For briefer time intervals the rate of growth may be much faster—70μ in four hours, 36μ in forty-five minutes, and 10μ in ten minutes. "Selective myelination" under the influence of sheath cells which simultaneously touch both myelin-emergent and non-myelin-emergent fibres presents a striking demonstration of the fundamental difference between these two types of fibres. In spite of the essential rôle of the sheath cell in myelinogenesis, the myelin sheath is not a part of the sheath cell, but is an adjunct of the axis cylinder. Three varieties of anastomosis formation between normal nerves have been observed.

Innervation of the Human Lung.

O. LARSELL AND R. S. DOW (*American Journal of Anatomy*, Volume LII, 1933) give an account of the arrangement of nerve bundles, ganglia and fibres within the lungs, and especially the various types of nerve endings at the different points of the bronchial tree and elsewhere. Although nerve trunks were traced to the pleura, especially near the hilum, no nerve terminations of an afferent type were, on account of the failure of the stain, found in the human pleura. Various types of afferent nerve endings were found: (i) in bronchi as far as the proximal end of alveolar ducts, (ii) in atrial walls, (iii) in some of the bands of bronchial muscle (smooth muscle spindle), (iv) in the adventitia of pulmonary artery, and (v) in the perichondrium of bronchial cartilage plates on the side towards the bronchial lumen. Motor terminations were found in bronchial muscles and bronchial mucous glands. These appear to arise from cells in bronchial ganglia. The motor endings in the smooth muscles of the pulmonary and bronchial arteries come *viâ* the periarterial plexus from the upper thoracic sympathetic ganglia.

Cells of the Thyreoid Gland.

B. WEBSTER (*American Journal of Anatomy*, Volume LII, 1933) submits evidence which suggests that the so-called "chief" cell of the acinar epithelium of the thyreoid gland is an exhaustion form and that, following the administration of iodine, it is rapidly transformed into the colloid cell type. This change is accompanied by an increased secretory activity of the cell, as indicated by increased heat production.

Nerve Supply of the Eye of the Cat.

E. M. DEERY (*Bulletin of the Neurological Institute of New York*, March, 1932) describes observations made on cellular elements which enter the developing eye-ball. He found that a constant migration of neuro-ectodermal elements ultimately destined to enter the eye-ball, occurred in cat embryos between the eight and fifteen millimetre stages. The immediate origin of such cells was from the ciliary ganglion *Anlage* and from loose aggregations of cells about the ophthalmic artery, principally the former. The opinion is given that those migrations are secondary phenomena in that they occur after the major loci of the autonomic cells have been established by primary migrations from the developing neuraxis. The chief migration pathways are provided by the short ciliary nerves and the optic nerve.

Pain and Touch Fibres in Peripheral Nerves.

P. HEINBECKER *et alii* (*Archives of Neurology and Psychiatry*, April, 1933) detect by physiological means the peripheral nerves conducting the impulses which give rise to painful sensations. They were able to show that in the saphenous and other peripheral nerves of the dog and of man, painful stimuli and those causing reflexes associated with pain are carried over fibres that are of the somatic myelinated type. These are an entirely different type of fibres physiologically from the unmyelinated fibres of the sympathetic system, of the vagus and depressor nerves, and even from the myelinated fibres of the sympathetic. Other results lend considerable support to the theory of specific nerve pathways.

Special Articles on Treatment.

(Contributed by request.)

XII.

THE TREATMENT OF ACNE.

BEFORE discussing the treatment of *acne vulgaris* it may be as well to recall to mind some details of the pathology of this condition. Acne almost invariably occurs, or at least commences, in persons suffering from seborrhœa, the oily skin acting as an excellent medium for the growth of the various organisms found. These organisms, together with the reaction of the skin to them, constitute the pathogenic picture. The pityrosporon of Melassez, with its consequent exfoliation of horny cells and cuticular inflammation, is frequently a complication. The elementary acne lesion is, however, due to an infection of the sebaceous glands by the acne bacillus with some hyperkeratosis of the mouths of the follicles and shedding of the horny cells. This is frequently complicated by the *Staphylococcus epidermidis albus*. The presence of the pyogenic organisms increases the leucocytic exudate and pustular formation. The terms *acne punctata*, *pustulosa*, *indurata* and *necrotica* are descriptive of the progressive pathological changes that take place, and give some indication of the form of local treatment necessary. In all cases of acne the scalp should be examined and any *pityriasis capitis* or seborrhœa, if present, should receive the requisite treatment.

The general treatment and management of acne is important. Any suggestion of digestive disturbances, constipation, anæmia, pelvic abnormality or focal infection should be carefully investigated and suitably treated. Cases are not infrequently seen in which the removal of a tooth for apical trouble, or the treatment of some nasal focus of infection alone will cause a marked improvement of the skin. Some patients with severe acne become so sensitive about their condition that they avoid the beneficial effects of fresh air, sunlight and exercise.

The diet should be watched. I usually forbid sweets, especially chocolate, pastry, cheese, condiments, sausages and the flesh of the pig. With reference to the latter, some interesting cases of sensitiveness to pig fat have recently been reported, and I have had a parallel case in a relative of my own, in which the ingestion of pork or bacon invariably produces pustules on the face. It is suggested that it is not a question of indigestion in these cases, but of the excretion of a fat which may directly irritate the walls of the follicle and give the organisms a food from which to make irritant toxins. It is also possible that these fats are of a different melting point from the ordinary sebaceous oil and remain as fatty plugs in the mouth of the follicle. With regard to sweets, many patients with seborrhœa have a low sugar tolerance, hence an excess of sugar in the diet would be liable to make an existing acne worse.

Medicinally, tonics such as *mistura ferri aperiens* or *mistura ferri et ammoniæ citratis* are sometimes indicated, or if there is any accompanying rosacea, dilute hydrochloric acid in doses of 1·5 to 1·8 mils (25 to 30 minims) three times a day, with a menthol pill, 0·06 gramme (one grain), or ichthyol, 0·3 mil (five minims), in capsules may be found useful.

In the local treatment of acne I am going to mention first the value of X rays. In a good many text books a few lines only at the end of the subject are devoted to this form of treatment. This is inclined to be misleading, as both abroad and amongst our own dermatologists the practice of applying X rays early in the treatment and in some cases at the very outset is becoming increasingly popular. In this way much time and trouble may be saved for the patient, especially when the acne is fairly chronic and localized to certain areas and when seborrhœa is not a marked feature. In other cases it is better to get as much improvement as possible by other means and so reduce the areas that it will finally be necessary to treat with X rays. The dose of X rays given is generally one-third or one-quarter pastille dose weekly for three to five doses, with a suitable rest period and a further course if necessary, the varying susceptibility of different skins being watched.

Ultra-violet light has been tried extensively over a lengthy period. There are two classes of cases in which I have found it beneficial: (i) In pale, anæmic patients of the strumous type, to whom it is best given as general light baths; it is a valuable adjunct to other treatment. (ii) In cases of profuse superficial pustular acne of the back, in which one or two good peeling doses are a good preliminary to other treatment.

Vaccines on the whole I have found disappointing. Some cases, in which the pustules are deep-seated and there is a good deal of perifollicular inflammation, are improved. These cases may also respond to a course of manganese butyrate given subcutaneously or to injections of "Aolan" given intramuscularly. I have used antivirus, both the liquid and emollient preparations, only in cases of acne of the back, in conjunction with ultra-violet light, and the results were good, but how much of the improvement was due to the antivirus it would be impossible to say.

In the treatment of acne by chemical applications, far better results are obtained in patients under twenty years, and in patients with excessively greasy skins. Lotions are in most cases preferable to ointments.

Bearing in mind the pathological changes present in the skin, the object of the treatment will be:

(1) To remove the comedones and reduce the condition of seborrhœa.

(2) To destroy the organisms.

(3) To remove the hyperkeratosis by exfoliation.

(4) To apply soothing lotions.

(1) The face should be washed with hot water and spirit soap, or *æther sulphuricus rectificatus* and *spiritus vini rectificatus* in equal parts. This, together with judicious massage and rubbing with a towel, will loosen the comedo and dissolve the sebum, and the comedo should be expressed with a suitable expressor. (X rays will inhibit the production of sebum.)

Both (2) and (3) may be accomplished by using various lotions containing sulphur, resorcin or mercury. A common formula is:

Zinci sulphatis } of each 0·6 to 0·18 gramme
Potassii sulphuratæ } (10 to 30 grains).
Aquæ rosæ, 30·0 cubic centimetres (one fluid ounce).

Or

Resorcin, 2% to 5%.
Spiritus vini rectificatus, 30·0 cubic centimetres (one fluid ounce).

Mercury in a lotion or ointment suits some patients. Sulphur and resorcin, 3% or 4% of each in a paste, may be found useful in removing the hyperkeratosis and exfoliating the skin. The sulphur and resorcin, separately or together, may be added to *lotio calaminæ*. When the skin becomes rough and peeling is observed, (4), a soothing lotion, such as calamine lotion, should be applied.

In some forms of *acne indurata* small raised abscesses occur which may require opening. A small incision only should be made, as very seldom is there much pus present, often only a gelatinous fluid exuding; in fact, some will settle down without an incision if X rays are applied, producing less scarring than when an incision is made.

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British Medical Association News.

SCIENTIFIC.

A MEETING OF THE SECTION OF MEDICINE OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, on June 15, 1933, DR. C. B. BLACKBURN in the chair.

The Functional Dyspepsias.

DR. O. A. A. DIETHELM read a paper entitled: "A Consideration of the Functional Dyspepsias" (see page 33).

DR. R. C. WINN congratulated Dr. Diethelm on his excellent paper. Dr. Winn had been especially interested in the charts showing the results of analysis of the gastric contents after the administration of fractional test meals. Dr. Diethelm had mentioned psychological factors; Dr. Winn remarked that in the course of psychoanalysis, almost every patient became afflicted with dyspepsia that disappeared when the psychoanalysis was finished. One form of psychogenic dyspepsia had as its basis an anxiety neurosis; a common type, especially among married women, was due to some sexual maladjustment, such as the practice of *coitus interruptus*. In this particular condition, if the wife could learn more hygienic methods of contraception, her symptoms would often disappear. Dr. Winn said that anxiety neurosis might occur in association with a psychoneurosis, and although correction of any coincidental sexual maladjustment might not abolish the condition, it might relieve it. If psychoneurosis existed in addition to anxiety neurosis, and the patient was not sufficiently relieved by attention to adult sexual maladjustments, the only way to remove the cause was by psychoanalysis, as psychoneurosis was due to certain psychological maladjustments of early childhood, among which were those known as oral eroticism and oral sadism. Dr. Diethelm had mentioned oral eroticism when discussing the psychological causes of dyspepsia.

DR. LAURENCE HUGHES remarked that Dr. Diethelm's paper had been so comprehensive that he felt there was very little to add. Dr. Diethelm had mentioned that functional dyspepsia might occur at any age; Dr. Hughes had been interested for some time in a particular type that was not uncommonly seen in children. These infants suffered from a condition so aptly described by Cameron as "nervous unrest"; they were the offspring of nervous parents, and were of a restless, wriggling type; they took their food in a nervous, hurried fashion, and swallowed quantities of air; a portion of the air in the stomach was vomited with some of the food, and the remainder passed on into the intestine, setting up an irritative diarrhœa. In this way the symptoms of dyspepsia were developed. Bromides were of value in the treatment of this condition.

DR. ALLAN S. WALKER said that those present were indebted to Dr. Diethelm for a comprehensive review of the subject of functional dyspepsia. The ground had been covered thoroughly, and he felt there was little more to say. Dr. Walker remarked that as a rule the pain of functional dyspepsia was not so severe as that of organic disease, but that it was occasionally severe and persistent, especially when it was of psychogenic origin. Tenderness was frequently elicited. The heaving abdominal aorta, which was often palpable in these cases, was apt to be tender; the colon was sometimes spastic and palpable and tender also. In discussing diet, Dr. Walker remarked that many people with functional dyspepsia did not eat enough. The thin, nervous women who got it into their heads that they were unable to eat this, that or the other, were sometimes difficult to deal with, but frequently improved greatly if they could be persuaded to take an adequate diet. He often wondered whether there was any justification for telling patients that they should not drink with their food; he thought it depended to some extent on the type of food; if food was sloppy, there was no need for extra fluid; if it was dry, there might be.

Dr. Walker remarked that before any treatment for gastroptosis was employed, it was necessary to find out whether the organ was "dropped" in the pathological sense and not merely in the physiological sense. The knowledge that certain organs were unusually low in position was often a drawback to nervous patients, who were, unfortunately, often worse after an X ray examination for this reason.

Dr. Diethelm had referred to the association of hypochlorhydria and achlorhydria with dental sepsis. Dr. Walker suggested that here the conditions belonged to two distinct categories: one in which there was congenital achlorhydria associated with dental sepsis, and one in which the dental sepsis had caused chronic gastritis. In the latter case, of course, the condition was not one of functional disease.

DR. A. J. GIBSON expressed his thanks to Dr. Diethelm for an interesting paper. He was impressed with the necessity of making a complete and careful study of all the bodily systems of persons suffering from functional dyspepsia. Unfortunately many dyspeptics suffered from a great number of abnormal conditions; it was sometimes difficult to know where to start. A female patient might have her teeth removed without any relief; X ray examination might then reveal disease of the appendix, yet she might feel no better after its removal; a gynæcologist might then operate on her for some ovarian trouble and her dyspepsia continued. In many such cases the mental factors had the greatest influence. Dr. Diethelm was to be congratulated for reviewing the subject so completely. Dr. Gibson recalled a patient who had suffered from very severe dyspepsia during each pregnancy; it had eventually been found that she was achlorhydric; but the administration of hydrochloric acid had aggravated her symptoms; she had refused to have her teeth removed. This patient had suffered from severe mental anxiety. Dr. Gibson remarked that it was difficult to know what to do for treatment in such cases.

Dr. Gibson thought that a well fitting abdominal support gave great relief in some cases; the difficulty was to obtain the right type of corset for the individual case. He concluded by remarking that the problem of the dyspepsias was a very difficult one, and that anxiety, which was so common in days of financial depression, played an important part in their causation.

DR. C. G. MCDONALD remarked that all would be agreed that Dr. Diethelm had taken a subject that most would be loath to tackle. Dr. Diethelm had dealt with it capably. Perhaps it was ungraceful to criticize in such circumstances; but in the first place, he did not like some of Dr. Diethelm's expressions, for example, autonomic imbalance and repetition phenomena; nor did he appreciate his references to the psychology of Freud. Dr. McDonald was unable to understand these things, though he had attempted to do so; he doubted whether they were of clinical importance. In regard to treatment, Dr. McDonald suggested that on the whole it was very bad to countenance the use of belts; frequently they retarded progress. It was best in the majority of cases to tell the patients to eat all foods; the laying down of a diet for them fixed in their minds the idea that there was something wrong with their stomachs. The employment of fractional test meals revealed various things; but it must not be forgotten that many persons who had never had symptoms, had achlorhydria or hyperchlorhydria. Dr. McDonald agreed with Dr. Diethelm that most of the functional dyspepsias were of nervous origin, but he did not believe that much reliance could be placed on autonomic imbalance, repetition phenomena *et cetera*; these terms belonged to the jargon of the psychiatrist, and he hoped that physicians would use the jargon as little as possible. Nevertheless he agreed that anxiety neurosis was important. The physician could do most good by finding out the patient's worries, assuring him that there was nothing organically wrong, and giving him more food and encouraging him to eat it.

DR. J. H. HALLIDAY remarked that there were patients suffering from functional dyspepsia who had symptoms suggestive of duodenal ulcer; these patients had hyperacidity. It was known that the majority of cases of functional disease did not go on to organic disease; but he asked whether it had been the experience of the senior physicians that many patients of this particular type became affected with demonstrable duodenal ulcer later on. He thought that these patients should be dieted. The treatment for duodenal ulcer was directed towards a limitation of secretion; on analogy, a similar type of treatment should be employed in these cases.

DR. E. H. STOKES expressed his thanks for Dr. Diethelm's interesting paper. Dr. Stokes mentioned the association of organic and functional disease. He recalled a patient who had suffered from pronounced symptoms of functional dyspepsia for some time without evidence of organic disease; later, a peptic ulcer had been found. He thought that test meals were of value in some instances; for example, in diarrhœa associated with achlorhydria, when the administration of hydrochloric acid was of great value. Dr. Stokes also stressed the importance of the examination of the contents of the fasting stomach in the differentiation of the functional from the organic dyspepsias. He was glad Dr. Diethelm had mentioned the nervous element, which was probably the most important single factor in the causation of the functional dyspepsias.

DR. D. G. MAITLAND mentioned that in some cases radiological examination revealed gastric hypertonicity and hyperperistalsis without the appearance of a crater or fleck in the duodenum. In some of these cases the colon was partly filled within two hours after the meal had been given. He pointed out that the duodenal cap might fill and empty very rapidly in the absence of any absolute evidence of ulcer. This, of course, did not rule out the possibility of a small mucosal erosion; it should be remembered that the radiologist dealt only with shadows, and X rays did not reveal everything. He suggested that in some cases gastric hypertonicity and spasticity might indicate the existence of the pre-ulcerative state.

DR. C. B. BLACKBURN remarked that people were too apt to talk of the stomach as though it were separate from the rest of the alimentary tract; after all, it was only a part of the tube; if one part of the tube misbehaved, other parts of the tube were likely to misbehave also. For example, Dr. Diethelm had mentioned the association of spastic constipation with dyspepsia. Dr. Blackburn suggested that in the first place the gastric disorder might have caused the constipation, which had then reacted on the stomach, and so a vicious circle had been established.

The nervous element was a very important factor in the causation of functional dyspepsias. Dr. Blackburn remarked that when a person suffering from a nervous dyspepsia entered his consulting room, he always felt sorry for the people who were to follow, for he realized that he would have to spend a long time over this patient. Also he liked to be early in the case; patients who continued unrelieved for a long time were apt to reach a stage where they did not seek relief, but visited the doctor merely to pour out their woes. He did not lay much stress on fancy diets or special methods of treatment, but preferred to try to adjust the patients' minds, to straighten out their domestic worries *et cetera*.

Dr. Gibson had mentioned that the administration of hydrochloric acid had done no good in one case. There were many patients who said that medicines did them no good; actually they did not intend the medicines to do them good. It was necessary to help these people to obtain a normal outlook. The patient should be treated and not the stomach. The patients should be taught to make the stomach a servant instead of a master.

Reflex dyspepsia did occur, and it was always imperative to discover whether there was anything wrong organically. Dr. Diethelm had mentioned gross overfeeding as a cause of functional dyspepsia; in such cases there was probably an organic lesion in the shape of gastritis. As Dr. Walker had pointed out, the dyspeptic symptoms associated with oral sepsis and achlorhydria were certainly due to gastritis. In such cases pus cells and bacteria were found in the gastric contents, and cure was very difficult if the disease had become chronic.

Dr. Blackburn stressed the importance of general rather than special treatment in nervous dyspepsia. He quoted the case of a business man who had developed nervous dyspepsia as the result of worry over his affairs. This man had been relieved of his symptoms immediately he had commenced a holiday on his yacht; in fact, he had remarked to Dr. Blackburn that before he had left he had been unable to eat a thing, but as soon as he had got aboard his yacht he had been able to eat anything.

In reply to Dr. Halliday's question, Dr. Blackburn remarked that the symptoms of duodenal ulcer were in effect a reflex dyspepsia. If the patient suffering from duodenal ulcer were not of a nervous type, he might have no symptoms perhaps until the ulcer perforated. The pain of duodenal ulcer was not due to the ulcer itself, but to reflex spasm. That was why it was so difficult from clinical evidence alone to say whether or not an ulcer was present.

Dr. Blackburn thought that the imposing of fancy diet restrictions was on the whole ridiculous and tended to aggravate introspection. On the other hand, certain restrictions were often advisable. For example, tobacco should be restricted if there was hyperacidity; it was also reasonable in such cases to advise the patient to take none of those articles, such as condiments, that were specially designed to increase gastric secretion. Most dyspeptics were more comfortable if they did not take much fluid with their meals. It was not rational to take much fluid with food. The lower animals did not drink with their meals. People were on the whole better if they had several full meals in the day rather than a number of snacks.

Dr. Diethelm, in reply, thanked the various speakers for their kind remarks about his paper. He appreciated the honour and privilege granted him. He agreed that he had accepted a difficult problem and one that he had found very hard to face. He agreed with Dr. Blackburn that dyspepsia and spastic constipation might form a vicious circle, but he was sure that in many cases the dyspepsia depended on the constipation and disappeared when the constipation was relieved. Undoubtedly oral sepsis was a cause of gastritis; but in his experience he had not been able to convince himself that gastritis was always present; he felt that in many cases there was merely a disturbance of function. Diet was an important matter; he was sure there were many cases in which dieting must be done. It was not as a rule advisable to make hard and fast rules with regard to diet; all that was necessary in many cases was to prohibit the foods that were bad for the patient; but often, if no dietary restrictions were made, the patient might not do well. Dr. Diethelm remarked that owing to the shortness of time at his disposal, he had purposely not discussed the use of radiology in the study of the functional dyspepsias; he agreed that it might be helpful in many cases. Dr. McDonald had referred to some abstruse phrases employed in the paper. Dr. Diethelm was convinced that there was a coordination between the sympathetic and parasympathetic systems in the control of gastric function, and that sometimes functional dyspepsia was caused by some disturbance of the balance between the two. He was sure that the cause in the nervous system must be treated. He believed that eroticism was an important factor. It was because psychology was so little understood that there was so much difficulty in treatment. Dr. McDonald had remarked that the wearing of belts was not good; Dr. Diethelm drew attention to the fact that in his paper he had mentioned that he was not enamoured of them, though probably they were sometimes of use. Dr. Diethelm had been pleased to hear Dr. Winn's remarks regarding the psychical elements in the causation of functional dyspepsia. He believed that there was a great deal of truth in what Dr. Winn had said. Dr. Walker had mentioned the occurrence of tender areas as a physical sign in some cases of functional dyspepsia; Dr. Diethelm remarked that he had meant to discuss this aspect, but had inadvertently omitted the portion dealing with tenderness in the revision of his paper. Cramp-like pain sometimes occurred; it was probably due to pylorospasm.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

Rock, Harry Owen, M.B., 1926 (Univ. Sydney), Culcairn.

Correspondence.

PATHOLOGICAL CONDITIONS OF THE CERVIX UTERI: TOTAL OR SUBTOTAL HYSTERECTOMY.

SIR: Remarks by Dr. Moran in the journal of May 27 and by Dr. Matters, Dr. Blewett and Dr. Johnson, in the issue of June 3, might possibly lead some readers to infer that the disadvantages and dangers inherent in the subtotal method have but now been discovered.

Although, so long as an advance has been made and humanity benefited, it does not much matter who is the author, yet "the love of praise" being, as Milton says, an "infirmity" of human nature, one is just a little disappointed that one's work and writings since 1917 in this and other journals and in the proceedings of the Australasian Medical Congress of November, 1923, have been forgotten.

The conclusions which I drew from a series of cases of cancer attacking the cervix after subtotal hysterectomy and published by me in this journal of date June 17, 1917, have been confirmed by surgeons all over the world. Notwithstanding the remarks of some speakers in the discussion, this deplorable occurrence is not uncommon. Apart from the danger of cancer, the residual cervix is a source of ill health in 90% of cases and therefore on this account alone should be, as a rule, removed. If my method of total hysterectomy be adopted, the mortality rate will not be greater than that accompanying subtotal hysterectomy. I have kept a list of all my cases with name, age, date, where operated, condition, result. To date I have done 538 operations by this method with three deaths.

In the discussion on Dr. Matters's paper some members misdescribed and delivered themselves dogmatically regarding the technique which they have evidently failed to apprehend.

It is not "a coning out of the cervical mucous membrane" or "of the endometrium", but a coring out of the inner half of the cervical muscularis with the attached mucous membrane and the complete removal of the vaginal portion of the cervix. Every particle of gland-bearing tissue including the compound racemose glands which dip deeply into the cervical muscularis, is completely removed.

It is incorrect to say that "the squamous epithelium is not removed" and that this might become cancerous. There is no squamous epithelium left, except that of the vagina.

It is also incorrect that "the subsequent discharge and morbidity is not always overcome". There cannot be any discharge except from the vagina. Dr. Matters also says, "several cases of subsequent hæmorrhage have been reported". Subsequent hæmorrhage is impossible unless a sarcoma should develop or have been present undiagnosed at the time of operation. Of this I have seen one case.

Vaginal examination some weeks after operation shows the vaginal vault to be almost smooth. Deep pressure discloses the firm ring of the outer half of the cervical muscularis to which are attached the parametrium, endopelvic fascia and utero-sacral ligaments. There is consequently no sinking down of the vault or shortening of the vagina.

With regard to the treatment of pathological conditions of the cervix (non-malignant), I cannot understand the craze for treating these by mechanical and electrical agents or radiation when ordinary surgical methods in use for the past fifty years have been entirely satisfactory. Dr. Beard is reported to have said in the discussion on Dr. Matters's paper that "he would advise all general practitioners to equip themselves with a cautery or diathermy apparatus". To that I comment, God help the unfortunate patients if that advice is taken! It has been shown that it is very difficult to control the effect of these agents; stenosis and interference with normal drainage have frequently occurred and we know how stasis of secretions in any part of the body fosters infection, also that scar tissue favours cancer development.

A *questionnaire* to the chief gynæcological clinics in America elicited that it was almost unknown for cancer to attack a cervix which had been repaired by trachelorrhaphy or resection.

The weekly "Proceedings of the Staff Meetings of the Mayo Clinic" of April 5, 1933, strongly emphasize the surgical principle that incisions made by a knife heal better than those made by any form of cautery. In short, the treatment of the pathological non-malignant cervix by ordinary surgical instruments is more complete, more certain, shorter and safer than by the methods advocated by Dr. Matters and the several doctors who agreed with him.

One greatly appreciates the learning and industry of which there is so much evidence in Dr. Matters's contribution.

Yours, etc.,

RALPH WORRALL,
M.D., M.Ch., F.R.A.C.S., Hon. F.A.C.S.,
Honorary Consulting Gynæcologist to the Sydney Hospital.

233, Macquarie Street,
Sydney,
June 12, 1933.

Post-Graduate Work.

A WEEK-END COURSE AT LISMORE.

THE New South Wales Permanent Post-Graduate Committee, in conjunction with the North-Eastern Medical Association, will hold a week-end intensive revision course at Lismore on Saturday, August 5, and Sunday, August 6, 1933, following the general meeting of the North-Eastern Medical Association. The course will consist of a number of lectures and clinical demonstrations. Special lectures will be delivered by Dr. A. Holmes à Court and Dr. Edgar Stephen.

The meeting of the North-Eastern Medical Association will be held at the Commercial Hotel, Woodlark Street, Lismore, at 2 p.m. on Saturday, August 5. A dinner will take place at the Commercial Hotel, Lismore, at 6.30 p.m. on Saturday, August 5.

Clinical demonstrations will take place at the Lismore District Hospital and Saint Vincent's Hospital, Lismore, on Sunday, August 6. An informal *conversazione* and discussions will be held on the evening of Sunday, August 6.

The fee for the course will be one guinea. It is requested that all those intending to be present for the course should notify Dr. J. R. Ryan, Lismore, as soon as possible.

OPHTHALMOLOGICAL COURSE IN SYDNEY.

THE New South Wales Permanent Post-Graduate Committee, in conjunction with the Ophthalmological Society of New South Wales, will hold a post-graduate course in ophthalmology in Sydney, commencing on Monday, November 6, 1933. The course has been especially designed to teach those in general practice the elements of refraction, and to give them the necessary practical training to carry out refractions in their own practice. The course will extend over a period of two or three weeks. The

mornings will be given to lectures, but each afternoon will be devoted to demonstration of cases illustrating the subjects of the morning lectures, and to retinoscopy.

The fee for the course will be three guineas. Owing to the fact that such a course must be limited in numbers, those wishing to attend are asked to register their names as soon as possible with the Honorary Secretary, New South Wales Permanent Post-Graduate Committee, 225, Macquarie Street, Sydney.

Obituary.

WILLIAM DAVID KERR McGILLIVRAY.

WE regret to announce the death of Dr. William David Kerr McGillivray, which occurred on June 25, 1933, at Broken Hill, New South Wales.

THOMAS LAWRENCE PAWLETT.

WE regret to announce the death of Dr. Thomas Lawrence Pawlett, which occurred on June 28, 1933, at North Sydney, New South Wales.

Diary for the Month.

JULY 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JULY 14.—Queensland Branch, B.M.A.: Council.
JULY 18.—New South Wales Branch, B.M.A.: Ethics Committee.
JULY 19.—Western Australian Branch, B.M.A.: Branch.
JULY 19.—Victorian Branch, B.M.A.: Clinical Meeting.
JULY 20.—New South Wales Branch, B.M.A.: Clinical Meeting.
JULY 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JULY 26.—Victorian Branch, B.M.A.: Council.
JULY 27.—South Australian Branch, B.M.A.: Branch.
JULY 27.—New South Wales Branch, B.M.A.: Branch.
JULY 28.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. D. McG. Steele (B.M.A.) has been appointed, pursuant to the provisions of the *Workers' Compensation Act* 1928, to be Certifying Medical Practitioner at Pyramid Hill, Victoria.

* * *

Dr. D. F. O'Brien (B.M.A.) has been appointed, pursuant to the provisions of the *Public Service Act* 1928, to be a Junior Medical Officer, Lunacy Department, Hospitals for the Insane, Victoria.

* * *

Dr. K. S. Wallace (B.M.A.) has been appointed Government Medical Officer at Bowraville, New South Wales.

* * *

Dr. R. T. Binns (B.M.A.) has been appointed Temporary Honorary Clinical Assistant (Medical Section) at the Adelaide Hospital, South Australia.

* * *

Dr. A. J. Meikle (B.M.A.) has been appointed Acting Superintendent of the Parkside Mental Hospital, South Australia.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes*, sought, etc., see "Advertiser," page xviii.

LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officers.

THE GIPPSLAND HOSPITAL, SALE, VICTORIA: Resident Medical Officer.

YALLOURN MEDICAL AND HOSPITAL SOCIETY, YALLOURN, VICTORIA: Assistant Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Combined Friendly Societies, Clarendon and Kangarilla districts. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor", THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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